Quail Valley Regional Water Tank III Project

Draft Initial Study/ Mitigated Negative Declaration

September 2022

Prepared for:

Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92570

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

This page intentionally left blank

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AK	Albus-Keefe and Associates
AMSL	above mean sea level
APE	Area of Potential Effects
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
AWWA	American Water Works Association
Basin	South Coast Air Basin
BMPs	best management practices
CAGN	coastal California gnatcatcher
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
CAL/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CBC	California Building Code
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFG Code	California Fish and Game Code
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRHR	California Register of Historical Resources
dB	decibel
dBA	A-weighted decibel
DBESP	Determination of Biologically Equivalent or Superior Preservation
District	Eastern Municipal Water District
DOC	California Department of Conservation
DPM	diesel particulate matter
GHG	greenhouse gas
HELIX	HELIX Environmental Planning, Inc.
I-	Interstate
IBC	International Building Code
in/sec	inches per second
IS/MND	Initial Study/Mitigated Negative Declaration

ACRONYMS AND ABBREVIATIONS (cont.)

L_{EQ}	noise equivalent level
LRA	Local Responsibility Area
LST	localized screening threshold
LUST	leaking underground storage tank
MBTA	Migratory Bird Treaty Act
MRZ	mineral resource zone
MSHCP	Multiple Species Habitat Conservation Program
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSLU	noise-sensitive land use
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
Pb	lead
PF	Public/Quasi Public Facilities
PM	particulate matter
PPV	peak particle velocity
PSE	Participating Special Entity
RCA	Western Riverside County Regional Conservation Authority
ROG	reactive organic gases
ROW	right-of-way
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SO_2	sulfur dioxide
SR	State Route
SWPPP	Storm Water Pollution Prevention Program
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
TCP	Traditional Cultural Property
TCR	Tribal Cultural Resources
TUA	Traditional Use Area

ACRONYMS AND ABBREVIATIONS (cont.)

USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VdB	vibration decibel
VHFHSZ	very high fire hazard severity zone

This page intentionally left blank

Draft Mitigated Negative Declaration

1.	Project Name:	Quail Valley Regional Water Tank III Project
2.	Project Description:	The project consists of the construction of a 1.63-million-gallon potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure. The tank would have a height of 40 feet and a diameter of 101 feet.
3.	Project Location:	The project site is located east of Interstate (I-) 15 and west of I-215 in the Quail Valley community in the western portion of the City of Menifee, Riverside County. The project site is located at South Canyon Drive.
4.	Project Applicant:	Pulte Group Inc. 27401 Los Altos, Suite 400 Mission Viejo, CA 92691

The Lead Agency, Eastern Municipal Water District (District), having reviewed the Initial Study of this project does hereby find and declare that the project would not have a significant effect on the environment. A brief statement of the reasons supporting the Lead Agency's findings are as follows:

An Initial Study was conducted to evaluate the potential effects of this project upon the environment. Based upon the findings contained in the attached Initial Study, it has been determined that this project would have a less-than-significant impact on the environment. The Initial Study concluded that potentially significant construction-related impacts would occur with respect to biological resources (nesting birds, burrowing owls, coastal California gnatcatcher, Riversidean sage scrub, and aquatic resources), cultural and tribal cultural resources (potential for subsurface cultural resources to be encountered), geology and soils (potential for fossils to be encountered), hazards (wildland fires), and noise (potential noise effects resulting from construction); however, impacts would be less than significant with mitigation. Potentially significant impacts associated with biological resources would be mitigated by implementing a pre-construction nesting bird and burrowing owl survey; establishing temporary construction fencing; conducting biological monitoring during construction; paying the appropriate (Western Riverside County Multiple Species Habitat Conservation Plan [MSHCP]) mitigation impact fee; and acquiring the appropriate aquatic resources permitting and related purchase of off-site aquatic rehabilitation credits as required by the resource agencies. Potentially significant impacts to cultural and tribal cultural resources would be mitigated by retaining the services of a qualified archaeologist and a Native American monitor to evaluate, recover, and report on resources that may be uncovered during ground-disturbing activities. Potentially significant impacts to geology and soils would be mitigated by paleontological monitoring in areas known for high sensitivity. Potentially significant impacts related to wildland fires would be mitigated with the preparation of a fire safety plan. Potentially significant impacts to noise would be mitigated with the preparation and implementation of a construction noise plan. The project would result in less-than-significant or no impacts to the following environmental issues areas: aesthetics, agriculture and forestry resources, air quality, greenhouse gas emissions, hydrology/water quality, land use and planning, mineral resources, population and housing, public services, recreation, transportation/traffic, utilities and services systems, and wildfire. Accordingly, a Mitigated Negative Declaration has been prepared.

The Lead Agency hereby finds that the Mitigated Negative Declaration reflects its independent judgment. A copy of the Initial Study is attached.

The location and custodian of the documents and other materials which constitute the record of proceedings upon which the Lead Agency based its decision to adopt this Mitigated Negative Declaration are as follows:

Eastern Municipal Water District
2270 Trumble Road
Perris, California 92570
https://www.emwd.org/public-notices

9/19/22
Date

Staff Signature

Initial Study and Environmental Checklist

Background Data

1.	Project Title:	Quail Valley Regional Water Tank III Project
2.	Lead Agency Name and Address:	Eastern Municipal Water District 2270 Trumble Road Perris, California 92570
3.	Contact Person and Phone Number:	Joseph Broadhead 951-928-3777 extension 4545
4.	Project Location:	The project site is located east of Interstate (I-) 15 and west of I-215 in the Quail Valley community in the western portion of the City of Menifee, Riverside County. The project site is located at South Canyon Drive.
5.	Project Sponsor's Name/Address:	Pulte Group Inc. 27401 Los Altos Suite 400 Mission Viejo, CA 92691
6.	General Plan Designation:	PF (Public/Quasi Public Facilities), RR1/2 (Rural Residential 1/2 acre min), 2.1-5R (2.1-5 dwelling unit/acre Residential)
7.	Zoning:	W-2 (Controlled Development Areas), R-A-10 (Residential Agricultural)
8.	Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?	The District has consulted with applicable Native American tribal representatives. Tribes who indicated to the District that they are interested in receiving notification were contacted. District staff has undertaken consultation with representatives from Pechanga Band of Luiseño Mission Indians to discuss the project and potential effects to significant cultural resources. Other tribes contacted declined consultation.

I. Introduction

The following Initial Study addresses the environmental impacts associated with the construction and operation of Eastern Municipal Water District's (herein referred to as the "District") Quail Valley Regional Water Tank III Project (herein referred to as "proposed project" or "project"). The purpose of the proposed project is to address an identified storage capacity deficit in the potable water system. This Initial Study has been prepared in accordance with the California Environmental Quality Act of

1970, as amended (CEQA), the State CEQA Guidelines, and the District's Administrative Code Resolution 5111, as amended. The District is the Lead Agency for this project for the purposes of CEQA.

II. Project Background and Description

Project Location

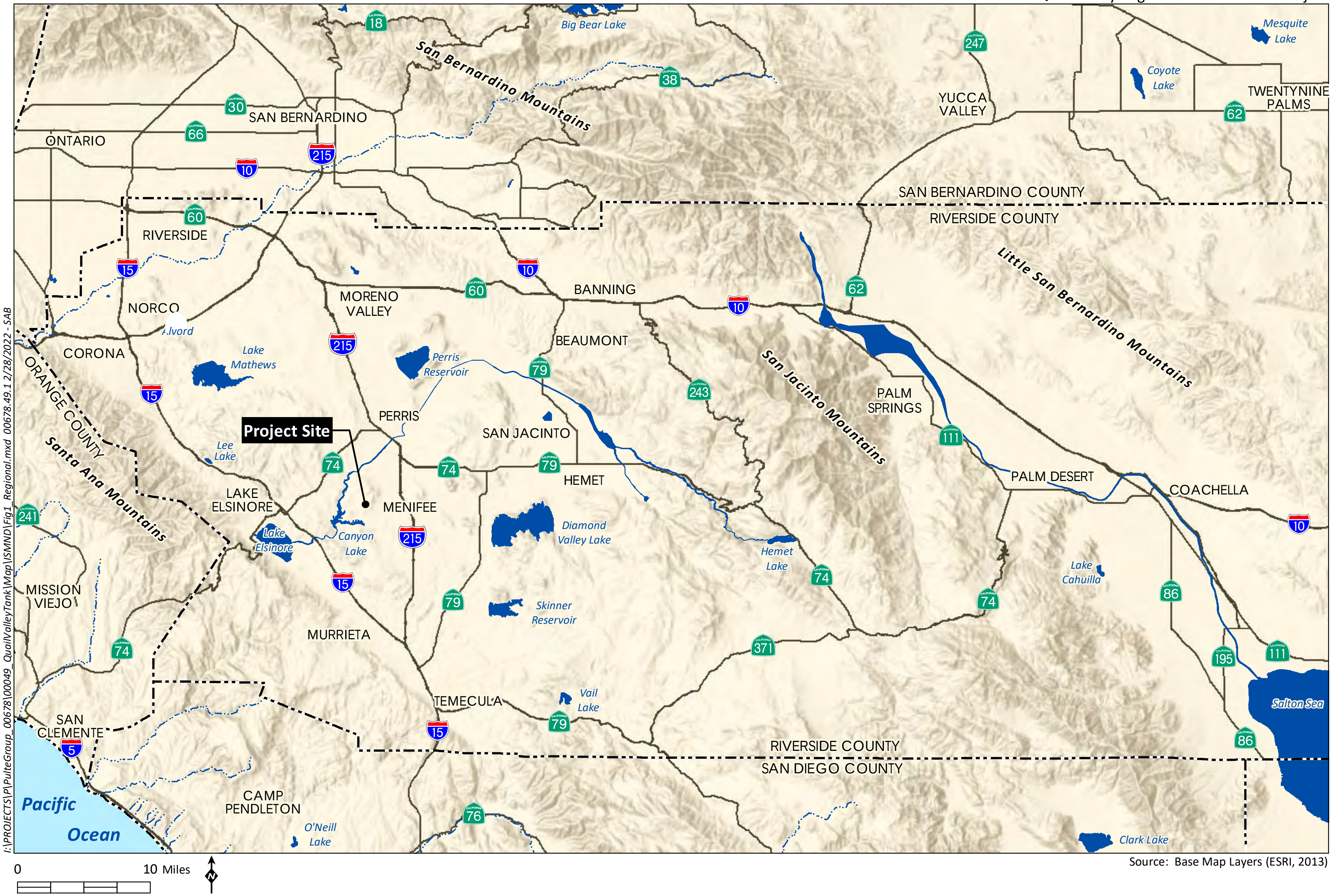
The project site encompasses approximately five acres and is located east of I-15 and west of I-215 in the Quail Valley community in the western portion of the City of Menifee (City), Riverside County (County; Figure 1, *Regional Location*), California. The project site is located on Assessor's Parcel Number (APN) 341-050-006 and a small portion of APN 341-050-007, which are 4.67 and 2.91 acres in total area, respectively. The project site is located east of Goetz Road, northeast of Canyon Lake. Specifically, the project site is located approximately 2.5 miles west of I-215 in Township 5 South, Range 3 West, Section 30 on the U.S. Geological Survey (USGS) 7.5-minute Romoland quadrangle (Figure 2, *Project Vicinity [USGS Topography]*). The project site coordinates are 33°42'27.97"N and 117°13'44.55"W. Two other water storage tanks (Quail Valley Tank I and II) are located on site.

The project is located within the boundaries of the adopted Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The District is not a signatory agency to the MSHCP but is utilizing the MSHCP as a Participating Special Entity (PSE). Public entities such as a utility company can request coverage under the MSHCP as a PSE. The MSHCP provides a regional context for biological resources within western Riverside County. The project occurs within the Sun City/Menifee Valley Area Plan but is not within a criteria cell. Although the MSHCP is not applicable to the District's projects, the proposed project has been planned and designed with consideration of the target conservation goals of the MSHCP, with project components being specifically sited within or adjacent to existing disturbed and developed lands and existing right-of-way (ROW).

Environmental Setting

The project site is mostly undeveloped, outside of the existing water infrastructure (see Figure 3, *Project Site [Aerial Photograph]*). The undeveloped portion of the site is comprised predominately of Riversidean sage scrub and disturbed habitat. Elevations within the project site range from approximately 1,794 feet above mean sea level (AMSL) along the edge of the foothills to approximately 1,712 feet AMSL at the base of the foothills. Surrounding land uses include the Quail Valley Water Tank I approximately 250 feet to the north, the Quail Valley Hydropneumatic Water Pump Station to the northwest, the Quail Valley Water Tank II approximately 50 feet to the east, a single-family residence to the south, and South Canyon Drive and undeveloped land to the west. Existing water infrastructure on and adjacent to the site is surrounded by security chain link fence. Access to the project site is via South Canyon Drive and a private access road.

The project area is mostly vegetated by disturbed Riversidean sage scrub, which is heavily dominated by California buckwheat (*Eriogonum fasciculatum*) and California sagebrush (*Artemisia californica*), with foxtail (*Alopecurus*), blue dick (*Dichelostemma capitatum*), and sumac (*Rhus*), along with non-native eucalyptus and pepper trees. The limited ruderal/disturbed annual grassland plant community on site is composed of annual grasses, weeds, and sparse emergent scrub. Plant species within this community include bromes and herbaceous annuals. The native vegetation within the project vicinity would have included a number of plants used by the Luiseño people for food, medicine, shelter, and ritual uses (Hedges and Beresford 1986; Sparkman 1908; White 1963). The native vegetation communities also

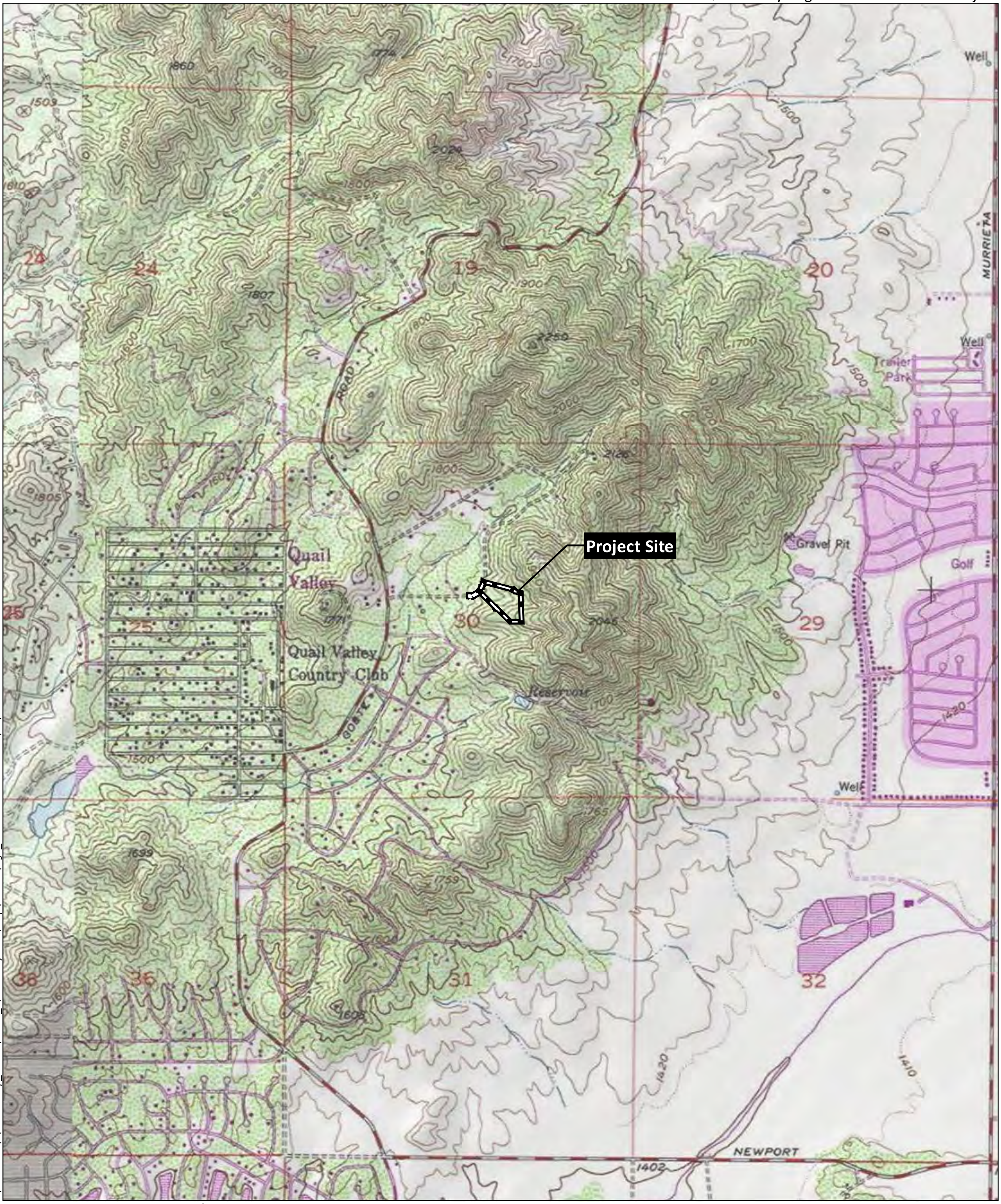


Source: Base Map Layers (ESRI, 2013)

HELIX Environmental Planning

Regional Location

Figure 1



I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\SMND\Fig2_USGS.mxd 00678.49.1 2/28/2022 - SAB

Source: Romoland 7.5' Quad (USGS)

0 2,000 Feet

N

HELIX
Environmental Planning

Project Vicinity (USGS Topography)

Figure 2

Source: Aerial (Maxar, 2021)

HELIX Environmental Planning

Project Site (Aerial Photograph)

Figure 3

provide habitats for numerous small mammals, reptiles, birds, and deer, which were exploited by the aboriginal inhabitants of the area for food and other uses. Water would have been available to native populations from a number of nearby unnamed ephemeral drainages from the foothills, along with the nearby San Jacinto River and Salt Creek.

The project is located on a small southwestern slope facing the community of Quail Valley. The project site and surrounding areas are within a portion of the southern California batholith near the northern end of the Peninsular Ranges province of southern California. This area is characterized by three major northwest-trending mountainous regions comprised of the San Jacinto Mountains, the Perris Block, and the Santa Ana Mountains. The project is located on the Perris Block, which is a large mass of granitic bedrock bounded by the San Jacinto and Elsinore fault zones. The relatively arid climate is partly the result of rain shadow cast by the Santa Ana Mountains. The surface geology of the project site includes Mesozoic-aged quartz-rich metamorphic rocks including quartzite and quartz-rich metasandstone in the eastern portion of the Area of Potential Effects (APE) and very old alluvial deposits dating to the early to middle Pleistocene in the westernmost portion of the APE (Morton 2003). Soils in the study area are primarily Lodo rocky loam (25 to 50 percent slopes, eroded). Additional soils present include Ysidora very fine sandy loam (2 to 15 percent slopes, eroded) and Ysidora gravelly very fine sandy loam, 8 to 25 percent eroded) (Natural Resources Conservation Service [NRCS] 2019).

Project Characteristics

Overview

The project consists of the construction of a welded steel 1.63-million-gallon potable water storage tank, detention basin, other appurtenances to support tank operations, and components that would connect to the existing adjacent water infrastructure (Figure 4, *Site Plan*). The tank would have a height of 40 feet and a diameter of 101 feet. The project is anticipated to require 6,105 cubic yards of cut and 28,741 cubic yards of fill, for a total import of 22,636 cubic yards. Imported soil is anticipated to come from the nearby Cimarron Ridge Specific Plan development (Cimmaron Ridge), with a haul length of 2.75 miles. The Cimmaron Ridge development will have Archaeological and Native American monitors on site for ground-disturbing activities. Therefore, the imported soil being received from that development would have been checked for cultural resource materials prior to arrival on the project site.

The project also includes the replacement of a small amount of pipeline that travels within the existing access road and partially within South Canyon Drive from the access road entrance to the driveway of the neighboring residence at 24425 South Canyon Drive. Additionally, approximately 500 feet of chain link fence would be installed on the project site per the District’s standards and would match the height of the existing on-site fencing.

Potable Water Storage Tank and Transmission Pipeline

The proposed potable water storage tank would be constructed with its base at an elevation of 1,772 feet AMSL and would measure approximately 40 feet in height with an internal diameter of approximately 101 feet. The finished floor and overflow elevations would be equal to the existing Quail Valley Tank II. Piping to the inlet and outlet of the new tank would connect to a proposed 18-inch pipeline, which would extend along the length of the access road, turn south within South Canyon Drive, and connect to existing infrastructure in front of the driveway of the neighboring residence at

24425 South Canyon Drive. This proposed pipeline would replace an existing pipeline that ranges from six to eight inches in diameter.

Quail Valley Tank III would be fed from the new 18-inch PVC line that would transition from PVC to steel prior to the elbow to the above-ground inlet piping. An approximate 190 liner feet of 16-inch Cement Mortar Lined & Coated Schedule 10 Steel Pipe would be installed for the piping of the new tank. Underground piping would be installed with locator wire per EMWD Standard Detail B-656 with a minimum cover of three feet. To protect the integrity of pipe and to prevent potential contamination of the water supply, joints and fittings would be welded per the applicable American Water Works Association (AWWA) requirements (specifically AWWA C206 Field Welding of Steel Water Pipe). After rehabilitation activities have been completed, and prior to potable water connections, the newly constructed Quail Tank III would be pressure tested and disinfected in accordance with District as well as AWWA and American National Standards Institute standards. After disinfection, a bacterial contamination test shall be competed under the observation of the Districts Representative.

Drainage Infrastructure and Detention Basin

The project would replace and reconfigure the existing drainage system on site. The proposed drainage infrastructure would include the construction of concrete-lined swales and gutters, which would collect the stormwater flows from the project site and divert them down the project slope (northwest of the proposed tank) and into the proposed detention basin which would be approximately 5 feet deep and 160 feet wide. The detention basin would be lined with water quality basin hydroseed mix to provide filtration and stabilize the soils, and would accommodate partial flows from the site as well as tank overflows. A concrete-lined, 40-foot-wide emergency spillway would be constructed on the western side of the detention basin. Three rip-rap energy dissipaters are proposed downstream of the tank at the entrance of the detention basin, as well as downstream of the spillway. A 12-foot-wide access road would be constructed at the northwestern side of the detention basin for operation and maintenance activities.

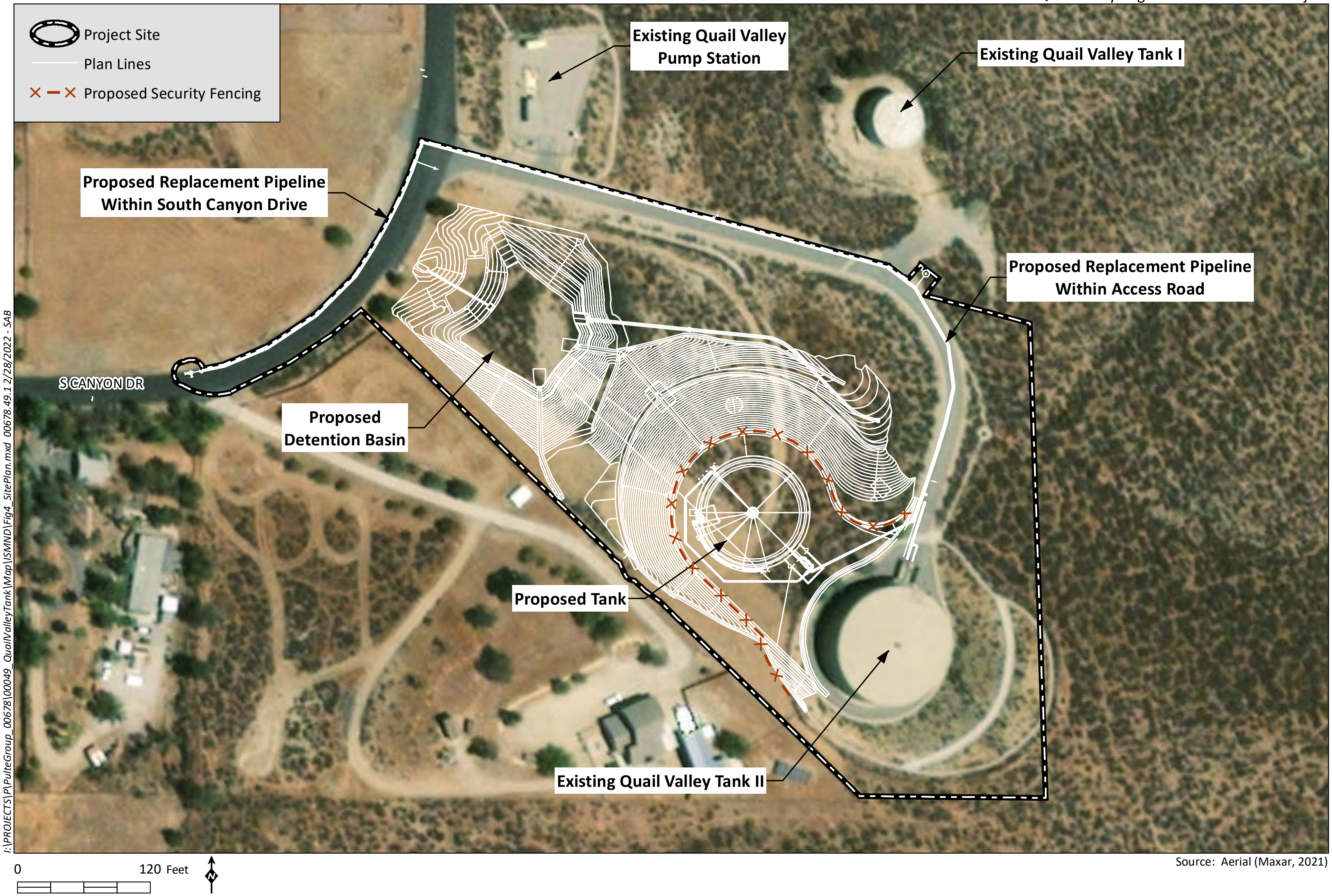
Access

Access to the site would be via South Canyon Drive and an existing access driveway on site. The proposed tank would include an access road along the north side of the tank, which is designed to slope away from the tank to avoid contamination and standing water. The perimeter of the road would include installation of a six-inch curb and a security chain link fence, equipped with three rows of barbed wire.

The project would temporarily disturb the existing access road and South Canyon Drive during the pipeline replacement activities. After the pipeline is replaced, the roads would be repaired and returned to pre-construction conditions. Damage caused to streets, including haul routes, alleys, sidewalks, curbs, or street furnishings, or to private property would be repaired by the contactor to the satisfaction of the District upon completion of project construction.

Landscaping

Landscape plans have been prepared in compliance with the City's Landscape Standards (City 2015). Additionally, the contractor would obtain an encroachment permit for potholing or construction of improvements, including installation of required street trees, in public rights-of-way and City-held easements. All landscape plans discussed herein can be visualized utilizing Figure 5*, Landscape Plan*.



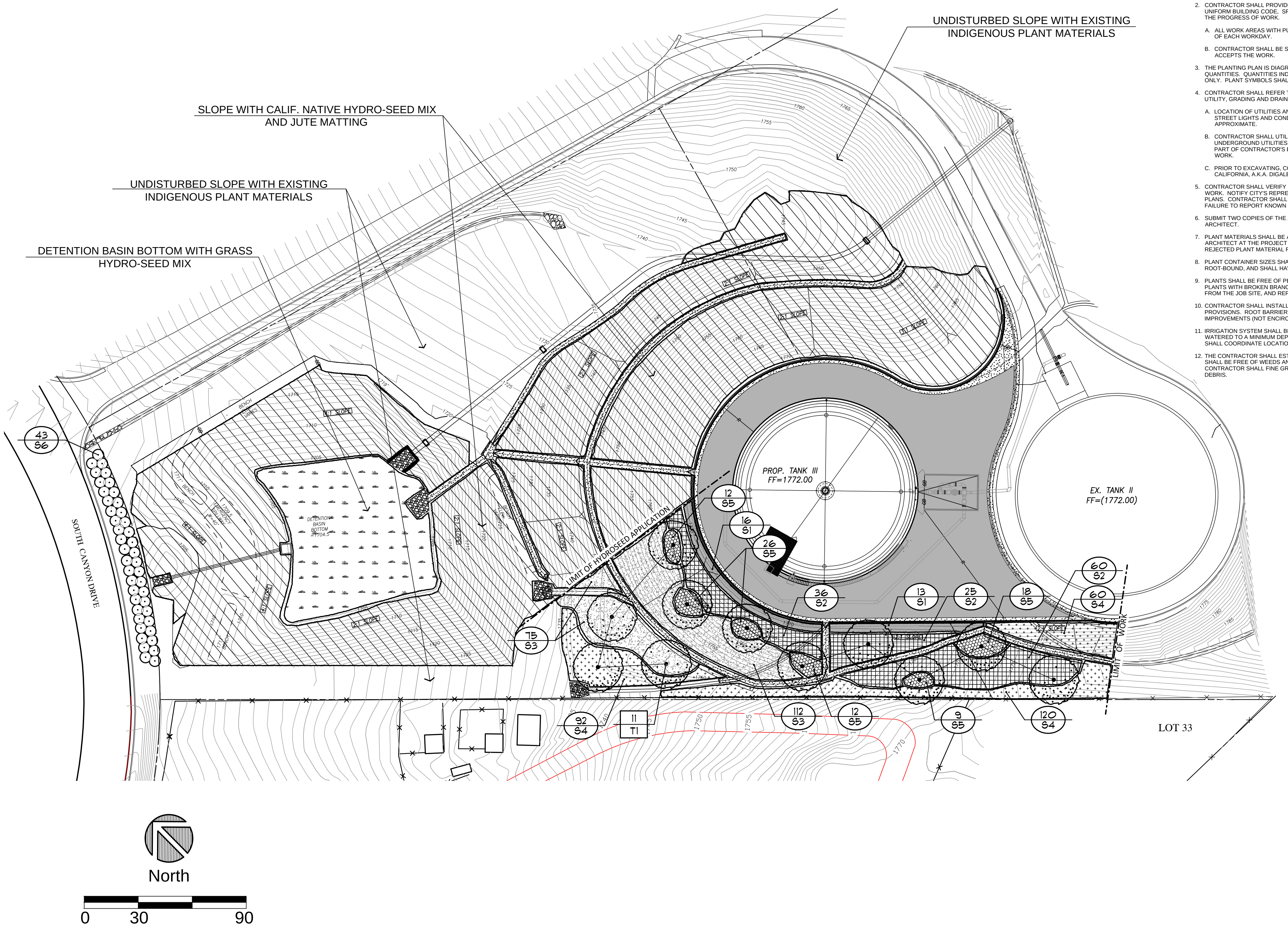
I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\ISMND\Fig4_SitePlan.mxd 00678.49.1 2/28/2022 - SAB

Source: Aerial (Maxar, 2021)

HELIX Environmental Planning

Site Plan

Figure 4



CITY OF MENIFEE PLANTING NOTES

1. REFER TO THE SPECIAL PROVISIONS FOR PLANTING SPECIFICATIONS.
2. CONTRACTOR SHALL PROVIDE SAFE AND CONVENIENT ACCESS FOR THE PUBLIC IN ACCORDANCE WITH THE UNIFORM BUILDING CODE, SPECIAL PROVISIONS, AND APPLICABLE LOCAL CODES AND REGULATIONS DURING THE PROGRESS OF WORK.
   A. ALL WORK AREAS WITH PUBLIC ACCESS SHALL BE CLEANED AND LEFT IN A SAFE CONDITION AT THE END OF EACH WORKDAY.
   B. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY AT ALL TIMES UNTIL THE CITY ACCEPTS THE WORK.
3. THE PLANTING PLAN IS DIAGRAMMATIC AND IS INTENDED TO SHOW APPROXIMATE PLANT LOCATIONS AND QUANTITIES. QUANTITIES INDICATED IN THE PLANT LEGEND ARE PROVIDED FOR INFORMATION PURPOSES ONLY. PLANT SYMBOLS SHALL TAKE PRECEDENCE OVER PLANT QUANTITIES.
4. CONTRACTOR SHALL REFER TO THE CIVIL ENGINEERING AND ARCHITECTURAL SITE PLANS FOR PRECISE UTILITY, GRADING AND DRAINAGE INFORMATION.
   A. LOCATION OF UTILITIES AND CONSTRUCTION ITEMS SHOWN ON PLANS INCLUDING, BUT NOT LIMITED TO STREET LIGHTS AND CONDUIT, PULL BOXES, DRAIN INLETS, SIGNS, HYDRANTS, TRANSFORMERS, ETC, ARE APPROXIMATE.
   B. CONTRACTOR SHALL UTILIZE APPROPRIATE METHODS AS REQUIRED TO DETERMINE LOCATION OF UNDERGROUND UTILITIES AND IMPROVEMENTS. FIELD INVESTIGATION TO LOCATE UTILITES SHALL BE PART OF CONTRACTOR'S BID, AND NO CHANGE TO THE CONTRACT AMOUNT WILL BE PERMITTED FOR THIS WORK.
   C. PRIOR TO EXCAVATING, CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA, A.K.A. DIGALERT, IN ACCORDANCE WITH CALIFORNIA GOVERNMENT CODE 4216.
5. CONTRACTOR SHALL VERIFY EXISTING SITE CONDITIONS, DIMENSIONS AND ELEVATIONS PRIOR TO START OF WORK. NOTIFY CITY'S REPRESENTATIVE AND LANDSCAPE ARCHITECT IF FIELD CONDITIONS DIFFER FROM PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING WORK, AND ASSOCIATED COSTS, DUE TO FAILURE TO REPORT KNOWN DISCREPANCIES BETWEEN PLANS AND FIELD CONDITIONS.
6. SUBMIT TWO COPIES OF THE AGRONOMIC SOILS REPORT TO THE CITY'S REPRESENTATIVE AND LANDSCAPE ARCHITECT.
7. PLANT MATERIALS SHALL BE ACCEPTED OR REJECTED BY THE CITY'S REPRESENTATIVE AND/OR LANDSCAPE ARCHITECT AT THE PROJECT SITE PRIOR TO PLANTING. THE CONTRACTOR SHALL IMMEDIATELY REMOVE REJECTED PLANT MATERIAL FROM THE SITE WITH NO CHANGE TO THE CONTRACT AMOUNT.
8. PLANT CONTAINER SIZES SHAWN ON PLANS ARE MINIMUM SIZES. PLANT MATERIAL SHALL NOT RE ROOT-BOUND, AND SHALL HAVE BEEN GROWN IN NURSERY CONTAINERS FOR A MINIMUM OF SIX MONTHS.
9. PLANTS SHALL BE FREE OF PESTS, DISEASES AND DEFORMITIES. THE LANDSCAPE ARCHITECT WILL REJECT PLANTS WITH BROKEN BRANCHES OR DAMAGED TRUNKS. CONTRACTOR SHALL REMOVE DAMAGED PLANTS FROM THE JOB SITE, AND REPLACE THEM WITH HEALTHY SPECIFIED PLANTS. TREES SHALL NOT BE TOPPED.
10. CONTRACTOR SHALL INSTALL ROOT CONTROL BARRIERS WITH TREES IN ACCORDANCE WITH THE SPECIAL PROVISIONS. ROOT BARRIERS SHALL BE PLACED ADJACENT, AND PARALLEL TO, EDGES OF HARDSCAPE IMPROVEMENTS (NOT ENCIRCLING ROOTBALL).
11. IRRIGATION SYSTEM SHALL BE FULLY OPERATIONAL AND ALL PLANTING AREAS SHALL BE COMPLETELY WATERED TO A MINIMUM DEPTH OF TWELVE (12) INCHES BEFORE START OF PLANTING WORK. CONTRACTOR SHALL COORDINATE LOCATION OF PLANTS WITH IRRIGATION EQUIPMENT AND PIPING.
12. THE CONTRACTOR SHALL ESTABLISH FINAL GRADES PRIOR TO START OF PLANTING WORK. PLANTING AREAS SHALL BE FREE OF WEEDS AND SURFACE ROCKS AND CLODS. AFTER COMPLETION OF PLANTING WORK, CONTRACTOR SHALL FINE GRADE ALL PLANTING AREAS AND REMOVE ROCKS, CLODS, CONTAINERS AND DEBRIS.
13. CONTRACTOR SHALL APPLY PRE-EMERGENT HERBICIDE IN ALL PLANTING AREAS PRIOR TO SPREADING MULCH. SUBMIT HERBICIDE MANUFACTURER'S DATA SHEETS TO CITY'S REPRESENTATIVE AND LANDSCAPE ARCHITECT FOR REVIEW AND ACCEPTANCE PRIOR TO APPLICATION.
14. CONTRACTOR SHALL SPREAD MULCH IN ALL PLANTING AREAS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. SUBMIT ONE CUBIC FOOT SAMPLE TO LANDSCAPE ARCHITECT FOR REVIEW AND ACCEPTANCE PRIOR TO BULK DELIVERY TO THE SITE.
15. UPON COMPLETION OF PLANTING OPERATIONS, CONTRACTOR SHALL REMOVE ALL DEMOLITION ITEMS, TRASH AND DEBRIS. REPAIR OR REPLACE ANY DAMAGED IMPROVEMENTS, AND THOROUGHLY CLEAN THE WORK AREA. CONTRACTOR SHALL BE RESPONSIBLE FOR LEGAL DISPOSAL OF ALL MATERIALS IN ACCORDANCE WITH APPLICABLE LOCAL CODES AND REGULATIONS.
16. CONTRACTOR SHALL PROVIDE A 36 INCH DIAMETER MULCHED CIRCLE AROUND THE BASE OF ALL TREES PLANTED IN LAWNS.
17. CONTRACTOR SHALL PROTECT IN PLACE EXISTING IRRIGATION IMPROVEMENTS AND PLANT MATERIAL INDICATED ON PLANS TO REMAIN. ANY EXISTING PLANT MATERIAL OR IRRIGATION EQUIPMENT AND PIPING DAMAGED OR REMOVED DUE TO CONSTRUCTION SHALL BE REPAIRED OR REPLACED PRIOR TO ACCEPTANCE OF THE PROJECT BY THE CITY'S REPRESENTATIVE AND LANDSCAPE ARCHITECT.
18. TREE AND SHRUB PLACEMENT:
   A. PLACEMENT OF TREES AND SHRUBS SHALL BE REVIEWED AND ACCEPTED BY THE CITY'S REPRESENTATIVE AND/OR LANDSCAPE ARCHITECT.
   B. CONTRACTOR SHALL PLACE STREET TREES NO CLOSER THAN THREE (3) FEET FROM SIDEWALKS AND BACK OF STREET CURBS. IN STREET MEDIANS, TREES SHALL BE PLANTED A MINIMUM OF FOUR (4) FEET FROM BACK OF CURBS. AFTER INITIAL PLACEMENT BY THE CONTRACTOR, THE CITY'S REPRESENTATIVE MAY ADJUST TREE LOCATIONS IN THE FIELD.
   C. IN PERIMETER PLANTING AREAS ADJACENT TO PARKING LOTS, WHERE TREES MUST BE PLANTED CLOSER THAN SIX (6) FEET TO PARKING LOT CURBS, ALIGN TREE TRUNKS WITH PARKING STALL STRIPING.
   D. PLACEMENT OF TREES AND SHRUBS SHALL NOT BLOCK VEHICULAR SIGHT LINES AT STREET INTERSECTIONS AND DRIVEWAYS.
19. UPON WRITTEN APPROVAL OF THE CITY'S REPRESENTATIVE, STREET TREES MAY BE PLANTED PRIOR TO PLACEMENT OF LOW-VOLUME IRRIGATION TUBING. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ADEQUATE WATERING OF ANY PLANTING PRIOR TO COMPLETION OF IRRIGATION SYSTEM.
20. ALL TREES PLANTED IN THE PUBLIC RIGHT-OF-WAY SHALL BE NURSERY STANDARDS (SINGLE-TRUNKED, CENTRAL LEADER).
21. CONTRACTOR SHALL COMPLETELY REMOVE AND LEGALLY DISPOSE OF EXISTING ROAD PAVING AND BASE MATERIAL IN LANDSCAPE PLANTING AREAS TO THE DEPTH OF NATIVE SUBGRADE SOIL, OR 24 INCHES WHICHEVER IS GREATER. REPLACE REMOVED MATERIAL WITH APPROVED IMPORTED TOPSOIL.
   A. IMPORTED TOPSOIL SHALL MEET SPECIFICATIONS IN ACCORDANCE WITH SPECIAL PROVISIONS. PROVIDE SUBMITTAL FOR TOPSOIL MATERIAL TO CITY FOR REVIEW AND ACCEPTANCE PRIOR TO START OF LANDSCAPE WORK.
   B. TOPSOIL SHALL BE PLACED IN PLANTING AREAS IN TWO LIFTS. SCARIFY SUBGRADE TO MINIMUM SIX-INCH DEPTH. FIRST LIFT OF TOPSOIL SHALL BE 12 INCHES DEEP AND THOROUGHLY BLENDED WITH NATIVE SUBGRADE SOIL. AFTER BLENDING, APPLY WATER TO SETTLE SOIL. CONTRACTOR SHALL PLACE REMAINING TOPSOIL IN SECOND LEFT TO FINISH GRADE.

PLANTING LEGEND

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE / SPACING	WUCOLS
TREES				
T-1	SCHINUS MOLLE	CALIFORNIA PEPPER	24" BOX STD. (8'-10' x 3'-4')	L
SHRUBS				
S-1	RHAMNUS CALIFORNICA 'EVE CASE'	COFFEEBERRY	1 GAL. @ 6' O.C.	L
S-2	CEANOTHUS GRIS. HORIZ. 'YANKEE POINT'	YANKEE POINT CEANOTHUS	1 GAL. @ 6' O.C.	L
S-3	CISTUS SKANBERGII	DWARF PINK ROCKROSE	1 GAL. @ 5' O.C.	L
S-4	ROSMARINUS OFFICINALIS 'HUNTING. BLUE'	HUNTINGTON'S ROSEMARY	1 GAL. @ 4' O.C.	L
S-5	MUHLENBERGIA CAPILLARIS 'REGAL MIST'	PINK MUHLY GRASS	1 GAL. @ 4' O.C.	L
S-6	ACACIA REDOLENS 'DESERT CARPET"	DESERT CARPET ACACIA	1 GAL. @ 6' O.C.	L

GROUNDCOVERS

No symbol

SHRUB AREAS ONLY:
3" THICK MINIMUM COVER - SHREDDED BARK MULCH - FOREST FLOOR BARK MULCH- 0-4" WITH JUTE MATTING - TYPICAL
SOURCE: AGUINAGA FERTILIZER COMPANY
IRVINE, CA (949) 786-9558

WATER QUALITY BASIN HYDROSEED MIX

Species Seed Lbs/Acre	Pure Live
Achillea millefolium	1.0
Artemisia douglasiana	0.1
Aristida purpurea	2.0
Carex praegracilis	1.0
Deschampsia cespitosa	1.0
Distichlis spicata	3.0
Elymus triticoides	5.0
Muhlenbergia rigens	0.2
Sporobolus airiodes	3.0
Hordeum intercedens	5.0
Trifolium willdenovii	4.0
	25.3

*NOTE: PLS LBS/ACRE ≠ Lbs/acre.
PLS LBS/ACRE is the most accurate way to specify seeds and takes into account both purity and germination.
PLS % = % Purity X % Germination.

Hydraulic slurry components:
FlexTerra HP-FGM 3,500 lbs/acre
Hydropost Compost 1,000 lbs/acre
BioSol Forte 7-2-1 600 lbs/acre
Tri-C Humate Soil Conditioner 400 lbs/acre
AM 120 Mycorrhizal Inoculum 60 lbs/acre

SLOPE HYDROSEED MIX WITH JUTE MATTING

BOTANICAL NAME	COMMON NAME	LBS. / ACRE
PLANTAGO INSULARIS	PLANTAGO	30
ESCSHCHOLZIA CALIFORNICA	CALIFORNIA POPPY	2
LIPINUS NANUS 'PIXIE DELIGHT'	LUPINE	3
ENCELIA CALIFORNICA	COAST SUNFLOWER	3
BACCHARIS PILULARIS	COYOTE BUSH	3
LOTUS SCOPARIUS	DEERWEED	5
RHUS OVATA	SUGAR BUSH	5
HETEROMELES ARBUTIFOLIA	TOYON	5
LASTHENIA CHRYSOSTOMA	GOLD FIELDS	1.5
MIMULUS PUNICEUS	MONKEY FLOWER	2
OENOTHERA CHEIRANTHIFOLIA	PRIMROSE	1.5
	TOTAL	61

HYDROSEED MIX SOURCE:
S&S SEEDS
(805) 684-0436
www.ssseeds.com
CONTACT: Ben Miller

Source: FRANK RADMACHER & ASSOCIATES, 2022

HELIX Environmental Planning

Landscape Plan

Figure 5

Landscaped areas would be fully maintained by the contractor during the plant establishment period in accordance with project specifications and City standards. Landscaping would be completed in four main phases in conjunction with construction of the tank: grading and construction, irrigation, planting, and the substantial completion and maintenance period. Landscaping work includes boulder placement, trenching for irrigation lines, soil preparation, installation of plant material, and inspection and maintenance. The total landscaped area on the project site is 84,300 square feet, or 1.9 acres. The landscaped areas are broken up into three hydrozones. Hydrozone 1 consists of trees and shrubs, would require low drip irrigation, and would cover approximately 18,400 square feet of the site. Hydrozone 2 consists of grass, would require medium rotor irrigation, and would cover 6,300 square feet. Hydrozone 3 consists of slope hydroseed, would require medium rotor irrigation, and would cover approximately 59,600 square feet of the project site. The Irrigation system would be fully operational and planting areas would be completely watered to a minimum depth of 12 inches prior to the start of planting.

Visual landscape screening on the western boundary of the project site would be accomplished by planting 43 *Acacia redolens* or "Desert carpet acacia." Mature *Acacia redolens* can be anywhere from one to six feet in height, providing visual screening for the water detention basin immediately abutting the acacia screen. Additional visual screening would be provided on the southern boundary of the project site in between the southern project terminus and the proposed tank utilizing trees and shrubs. California Pepper trees *(Schinus mole*) at heights of 8 to 10 feet and 3 to 4 feet would be utilized to block views of the tank from neighboring residences and South Canyon Drive. When at maturity, California pepper trees can reach heights of 25 to 40 feet, providing a visual screening of at minimum more than half the height of the tank itself and at maximum the entire height of the tank. Additionally, several shrubs would be utilized as a visual barrier in that area, including coffeeberry (*Rhamnus californica)*, Yankee point ceanothus (*Ceanothus Gris. Horiz.)*, dwarf pink rockrose (*Cistus Skanbergii*) Huntington's rosemary (*Rosmarinus officinalis)*, and pink muhly grass (*Muhlenbergia capillaris)* (Landscape Plans 2021). For additional information on visual screens refer to Item 1.c. Areas of shrub would have groundcover of forest floor bark mulch 0 to 4 inches with jute matting to prevent erosion.

The areas of 2:1 and 3:1 slope on the northern and northeastern side of the proposed tank would be revegetated post grading with slope hydroseed mix with jute matting. This hydroseed containing California Poppy, lupine, monkey flower, coyote brush, deerweed, coast sunflower and other native California plant species would stabilize the graded area and prevent future loss of topsoil and erosion post-construction. The detention basin would be graded with the northwestern sides at a 4:1 slope and the southeastern sides at a 2:1 slope. The sides of the basin would be vegetated with the slope hydroseed mix with jute matting. The bottom of the detention basin would be vegetated with water quality basin hydroseed mix which includes creeping wild rye *(Elymus triticoides),* saltgrass *(Distichlis spicata),* common yarrow *(Achillea millefolium),* alkali sacaton *(Sporobolus airiodes),* bobtail barley *(Hordeum intercedens)* and several other species that provide filtration and other specialized water quality benefits (Landscape plans 2021). The proposed landscaping would employ water use efficiency requirements as a sustainability feature.

Construction Activities

Project construction is assumed to occur over an approximately 17-month period starting in March 2023 and completing in August 2024. Construction activities would include demolition, site preparation, grading, installation of underground utilities, tank construction, paving, and architectural coating (e.g., painting). It is assumed that the installation of underground utilities would occur during the grading phase. During grading, the project would involve approximately 6,105 cubic yards of cut and 28,741 cubic yards of fill, for a net fill of approximately 22,636 cubic yards. Construction hours would be in accordance with Menifee City Noise ordinance §8.01.010, and occur Monday through Saturday (except nationally recognized holidays), 6:30 a.m. to 7:00 p.m. Demolition is proposed to start in March 2023 and would take an estimated 30 days to complete. The demolition at the site is minor and would mostly include existing stormwater infrastructure. Existing stormwater infrastructure would be removed including several of the existing swales and rip-rap pads. There is a chain link fence surrounding the existing Quail Tank II that would also be removed. The equipment estimated to be used is two crawler dozers and a water truck. It is estimated that 100 cubic yards of vegetation and other cleared materials would be removed and disposed of on site. Clearing/grubbing activity is expected to take 45 to 60 working days. The equipment estimated to be used is two crawler dozers and a water truck. Grading would take approximately three months and soil hauling would take place for approximately 10 days within that time. Underground infrastructure construction is expected to last three months. The equipment estimated to be used is two diesel 6-cylinder engines, a water truck, and an excavator. The physical building of the tank would begin after grading has been completed. There would be an average of 10 truck trips per day during construction and equipment utilized would be cranes, delivery trucks, and concrete delivery welder trucks. Paving would last 30 days and utilize asphalt delivery trucks. The final step is the painting of the tanks which would take place over 30 days and would utilize low-or no-VOC paint. Long-term activities at the project site would include periodic maintenance and routine security checks.

Transportation

The project would utilize best management practices (BMPs) to limit the project's impacts to South Canyon Drive. The contractor would minimize the obstruction to the roadway to the extent feasible. Convenient access to driveways, houses, and buildings along the line of work would be maintained. Temporary crossings would be provided and maintained in good condition. No more than one crossing or intersection, street, or road would be closed at one time.

Project Approval

Pulte Group is the project proponent and the District is the Lead Agency under CEQA. In its role as Lead Agency, the District is responsible for ensuring the adequacy of this Initial Study. Permits and approvals from other agencies also would be required for the proposed project. Table 1, *Required Permits and Approvals*, below summarizes these required permits and approvals.

Table 1
REQUIRED PERMITS AND APPROVALS

Permit/Approval	Permitting/Approving Agency	Permit/Approval Trigger
National Pollutant Discharge Elimination System (NPDES) Construction General Permit, Order No. 2009-0009-DWQ (As amended by 2010-0014-DWQ and 2012-0006-DWQ)	California Regional Water Quality Control Board, Santa Ana Region	Required prior to construction activity, upon completion of Notice of Intent and Storm Water Pollution Prevention Program (SWPPP)
Encroachment Permit	City of Menifee	Required prior to work performed in the public right-of-way
Permit Amendment	Department of Drinking Water	Prior to tank operation

Permit/Approval	Permitting/Approving Agency	Permit/Approval Trigger
Certificate of Inclusion as a Participating Special Entity under the Western Riverside Multiple Species Habitat Conservation Plan	Western Riverside County Regional Conservation Authority	Required prior to construction activity
Section 404 Nationwide Permit 14	United States Army Corps of Engineers	Required prior to impacts to the on-site ephemeral drainage
Section 401 Water Quality Certification	California Regional Water Quality Control Board, Santa Ana Region	Required prior to impacts to the on-site ephemeral drainage
Section 1602 Streambed Alteration Agreement	California Department of Fish and Wildlife	Required prior to impacts to the on-site ephemeral drainage

III. Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that may require mitigation to reduce the impact from "Potentially Significant Impact" to "Less than Significant" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture / Forestry Resources	☐ Air Quality
■ Biological Resources	■ Cultural Resources	☐ Energy
■ Geology/Soils	☐ Greenhouse Gas Emissions	■ Hazards and Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use / Planning	☐ Mineral Resources
■ Noise	☐ Population / Housing	☐ Public Services
☐ Recreation	☐ Transportation	■ Tribal Cultural Resources
☐ Utilities / Service Systems	☐ Wildfire	■ Mandatory Findings of Significance

IV. Determination

On the basis of this initial evaluation that follows:

- ☐ The proposed project is exempt from CEQA pursuant to the general exemption (CEQA Guidelines, 15061 (b)(3)), a statutory exemption, and/or a categorical exemption, and that if a categorical exemption, none of the exceptions to the exemption apply. A NOTICE OF EXEMPTION will be prepared.
- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ■ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR) is required.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental document is required. FINDINGS consistent with this determination will be prepared.

Signature	9/19/22 Date

~~Al Javier, Director ERC~~ Joe BROADHEAD
Eastern Municipal Water District

V. Evaluation of Environmental Impacts

This section evaluates the potential environmental effects of the proposed project using the environmental checklist from the State CEQA Guidelines as amended. The definitions of the response column headings include the following:

A. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.

B. “Less-Than-Significant Impact with Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less-Than-Significant Impact.” The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

C. “Less-Than-Significant Impact” applies where the project creates no significant impacts, only less-than-significant impacts.

D. “No Impact” applies where a project does not create an impact in that category. “No Impact” answers do not require an explanation if they are adequately supported by the information sources cited by the lead agency which show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors, as well as general standards (e.g., the project would not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

1. Aesthetics

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	■	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	■
c. In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	■	☐

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	■	☐

Discussion

The City encompasses numerous brush-covered hills and low mountains surrounded by a series of interconnected, broad, nearly flat-bottomed valleys. The steepest slope and largest cluster of hillsides can be found north of Menifee Lakes, traveling northward across McCall Boulevard. Quail Valley also has a substantial number of steep hillsides that influence development patterns in the area. Elevations in the City range from about 1,400 feet AMSL for the valley floor to approximately 2,600 feet AMSL for the local hills; Bell Mountain, an important landmark in the city, is 1,850 feet AMSL. Menifee includes parts of three valleys: the Perris Valley in the north end of the City, the Menifee Valley in the central part of the City, and the Paloma Valley in the southeast area. Land cover on valley floors includes developed land uses, farm fields, and open undeveloped areas. Most hillsides are covered with coastal sage scrub interspersed with boulder outcrops. The development pattern in the parts of the City with suburban density—Menifee Lakes, Quail Valley, Romoland, and Sun City—consists mostly of one-story detached single-family homes. Commercial uses are in several areas throughout Menifee but concentrated along the I-215 corridor, Newport Road, and McCall Road.

a. **<u>Less-Than-Significant Impact</u>**. The natural mountainous setting of the Menifee area is critical to its overall visual character, and provides scenic vistas for the community. Topography and a lack of dense vegetation or urban development offer scenic views throughout the City, including to and from hillside areas. Scenic features include gently sloping alluvial fans, rugged mountains and steep slopes, mountain peaks and ridges, rounded hills with boulder outcrops, farmland, and open space. Scenic vistas provide views of these features from public spaces. Many of the scenic resources are outside the City limits and beyond the project area. Scenic views from Menifee include the San Jacinto Mountains to the northeast and east; the San Bernardino Mountains to the north; the San Gabriel Mountains to the northwest; and the Santa Ana Mountains to the west and southwest. The Canyon Lake Reservoir lies next to the west City boundary. Menifee's two tallest peaks, Quail Hill at 2,250 feet and Bell Mountain at 1,850 feet, are identified in the General Plan Open Space and Conservation Element as important landmarks in the City. Bell Mountain is located approximately 5.5 miles southeast of the project site, making it too far away for the tank to have a visual impact from that vantagepoint. Quail Hill is the peak approximately 500 feet northeast of the project site. There are no official public trails on Quail Hill, however there are some unofficial trials along the northeast side of the bottom of the ridge, as well as 600 feet south of the project site on the neighboring ridge. The project site would not be visible from the northeast trail, as views would be blocked by Quail Hill itself. There would be possible views of the project site from the southern trails, however they would not differ substantially from the existing views, as one can already view the current Quail Tanks from the unofficial trail. There does not appear to be any official or unofficial trials to the peak; however, the project would not block or affect broad panoramic views from the peak. The project would not be visible from the northeast and would not differ substantially from the existing views to the southwest.

Areas to the south of the project area are characterized by residential development, where the majority of views toward the project site would be from private locations or blocked by intervening development or landscaping. Visibility of the project site from nearby scenic vistas would vary based on distance from the site, elevation of the trails, and presence of intervening vegetation and structures. Implementation of the proposed project is not anticipated to degrade views of scenic resources within the project area or more distant views of mountain peaks and ridges, since the tank would be set at an elevation lower than the adjacent hillside to the east and would not extend above the hillside's ridgeline. Additionally, the proposed tank would be of similar elevation and location to the existing Quail Valley Tank II. There are no designated scenic vistas near the project site that would be impacted by project implementation; therefore, scenic vistas would not be affected by the proposed project, and impacts would be less than significant.

b. **No Impact**. There are no officially designated scenic highways in or near the City of Menifee. State Route 74 (SR 74) passes through the northern part of the City and is considered an "Eligible State Scenic Highway – Not Officially Designated" by the California Department of Transportation (Caltrans). The nearest designated state scenic highway to the City is a portion of SR-74 in the San Jacinto Mountains about 17 miles east of the City (Caltrans 2017). Due to the visual significance of some areas, several roadways in Menifee have been officially recognized as Eligible County Scenic Highways. Eligible County Scenic Highways are county highways that have outstanding scenic qualities; although there is no official list of county highways eligible for scenic designation (as there is with state highways), they are considered eligible and do not require legislative action like state highways. There are three County Eligible Scenic Highways in the City of Menifee: I-215 from McCall Boulevard south to the City boundary; McCall Boulevard from I-215 on the west to Menifee Road on the east; and Menifee Road from McCall Boulevard north to the City boundary. The project site is over one mile away from possible County Eligible scenic highways and as such, project elements would not change the visual attributes along these roadways. Therefore, no impact would occur.

c. **Less-Than-Significant Impact**. The water tank and related facilities are proposed to be installed on a southwest-facing slope with one other water tank existing on the property (Quail Valley Water Tank II) and a second existing water tank (Quail Valley Water Tank I) adjacent to the project site. In addition, there are other utility facilities in the immediate project area, including the Quail Valley pump station adjacent to the site to the north. Surrounding land uses include the Quail Valley Water Tank I approximately 250 feet to the north, the Quail Valley Hydropneumatic Water Pump Station directly to the northwest, the Quail Valley Water Tank II approximately 50 feet to the east, as well as open space, a single-family residence to the south, and South Canyon Drive and undeveloped land to the west. For the purposes of this analysis, the project site and surrounding areas are considered a non-urbanized area and therefore, impacts are evaluated relative to change in the existing visual character or quality of public views of the site and its surroundings.

Construction activities associated with the project, including the presence of construction vehicles, excavated materials, and laydown areas would result in short-term visual effects to the project site and its surroundings. Views of the site during construction would include grading and construction activities, presence of construction vehicles and workers, and storage of building materials. These short-term elements could temporarily reduce the existing visual quality of the site during the construction period due to the introduction of additional visually contrasting features, such as newly graded land, construction fencing, construction equipment, and construction materials stockpiling and storage. Due to the short-term, temporary nature of these potential effects, impacts during project construction related to existing visual character or quality of the site and surrounding areas would be less than significant.

In order to ensure an understanding of potential visual effects related to project implementation, simulations were created to exhibit projected conditions following construction. The purpose of simulations is to provide a reasonably accurate projection of future conditions based on project-related changes to current views. The simulations provide future snapshots of specific locations with representative vegetation and maturity shown at planting and 10 years after installation. Visual simulations were created for two public viewpoints along South Canyon Drive. The first view is from South Canyon Drive near the southwest corner of the property looking eastbound toward the project site. The second view is from South Canyon Drive at the northwest corner of the property looking southeast toward the project site. Both view locations and view orientations are shown in Figure 6, *Viewpoint Locations*. Figures 7 and 8, *Viewpoint 1* and *Viewpoint 2*, respectively, show the views at the existing condition; condition at planting; and 10 years after project completion. The existing visual character and quality, and changes to the visual character and quality of each viewpoint resulting from project implementation are discussed below.

Viewpoint 1

<u>Existing Visual Character/Quality</u>. Under existing conditions, viewpoint 1 is dominated by the low-lying grasses and groundcover on gently sloping land in foreground views. In the middle ground, a small slope is visible that is also covered with the same vegetation types and a concrete brow ditch extends down the slope. The existing Quail Valley Water Tank II is situated on a level pad at the top of the slope. The top of the existing tank and adjacent hillside (pictured on the left side of photograph 7a) comprise a portion of horizon view elements from this viewpoint. Other visible elements include fencing and buildings associated with adjacent residential development, utility poles, and overhead utility lines in the middle ground (on the right side of photograph 7a). Mature trees are also present in the middle ground and background.

The mixture of the undeveloped vegetated slopes and developed elements of the adjacent residential property and water tank generally provide a rural/semi-rural visual character. In terms of visual quality, there is nothing particularly vivid or memorable within the view. The combination of developed and undeveloped visual elements results in generally low intactness of the view. The dominance of the undeveloped vegetated sloping terrain in the foreground provides some degree of visual unity, but the encroachment of developed features interrupts the cohesiveness of them. Overall, the existing visual quality of viewpoint 1 is low.

<u>Project Features Visible from Viewpoint 1</u>. As shown in the simulations in Figure 7 (photographs 7b and 7c), visible project features from this viewpoint would include the new water tank, brow ditches, landscaping, and a detention basin. The new water tank would be constructed in front of the existing tank (Quail Valley Water Tank II) and is visible in the middle ground. Project landscaping would be installed on a manufactured slope in front of the new tank. A concrete brow ditch would extend down the manufactured slope (below the tank in photographs 7b and 7c) and a second one would be located at the ground level on the right side of the new water tank and would connect to a detention basin, visible in the foreground (on the bottom left corner of the simulations in photographs 7b and 7c).

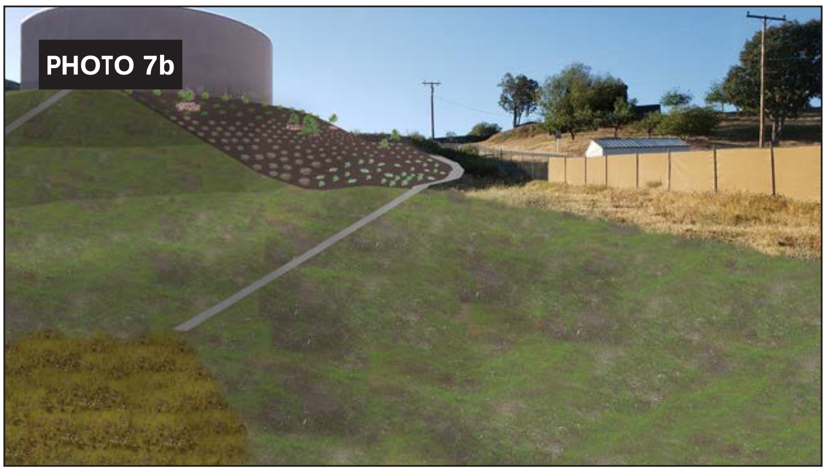
Source: Aerial (Maxar, 2021)

HELIX Environmental Planning

Viewpoint Locations

Figure 6

Existing Condition

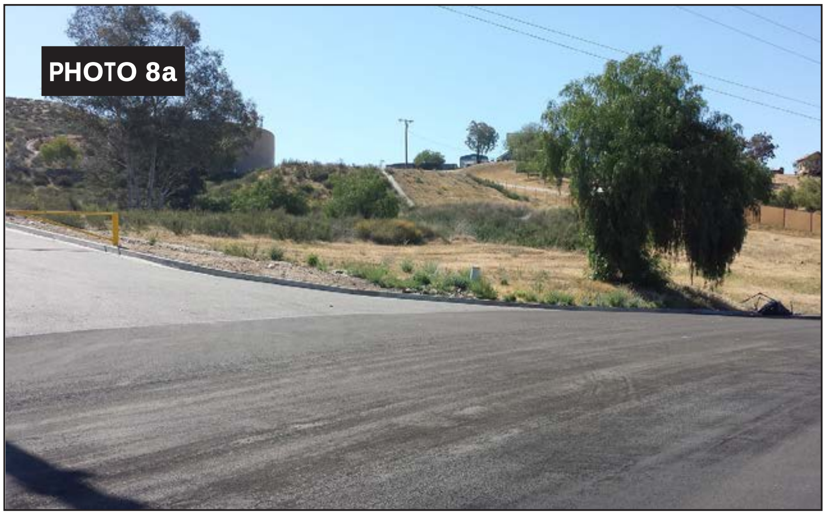


Condition at Planting

10 years Post Construction

Viewpoint 1

Figure 7



Existing Condition

Condition at Planting

10 years Post Construction

I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\ISMND\Fig8_Viewpoint2.indd 00678.49.1 2/28/2022 - SAB

HELIX
Environmental Planning

Viewpoint 2

Figure 8

Change to Visual Character/Quality. The proposed project would cause a low level of change to the existing visual character and quality of viewpoint 1. Existing views of the existing tank would be replaced with views of the new tank. The new tank would appear larger in scale compared to the existing tank because the new tank would be closer to the view location; however, it would not represent a substantial change in the view over existing conditions. Viewers currently see a water tank with vegetation in front of it and existing rural/semi-rural developed elements to the southeast with some ridgeline views in the background. The proposed view would also see these features in the same general physical arrangement. The proposed tank would be similar in size, shape, and color as the existing tank, and additional vegetation cover would be provided in front of it. As shown, the visual screening provided 10 years post construction from California pepper trees and other shrubs proposed as part of the project would enhance the visual quality of the site overall compared to the existing conditions. Views of a portion of the ridgeline to the east, the developed features of the residential property to the southeast, and utility poles and overhead utility lines would remain. Low-lying grasses within the detention basin would appear similar to other grasses and groundcover in the area. The vividness would remain low, as would the intactness and unity of the view. As such, the project would not substantially degrade the existing visual character or quality of viewpoint 1.

Viewpoint 2

Existing Visual Character/Quality. The existing visual conditions of viewpoint 2 are similar to viewpoint 1. The view is dominated by foreground elements of the developed South Canyon Drive and intersecting service road, which consist of gray pavement and darker gray curbs at the roadway edge. Existing vegetation on the gently sloping undeveloped land is visible in the middle ground. Vegetation from this viewpoint is much more varied compared to viewpoint 1, as there are existing trees and a variety of shrubs, grasses, and groundcovers present. The existing vegetation provides an assortment of different sizes and colors of plant species. The existing Quail Valley Water Tank II is visible behind one of the taller trees (on the left side of photograph 8a) in the middle ground. Fencing, buildings, utility poles, and overhead utility lines are also pictured in the middle ground. Portions of the adjacent ridgeline east of the existing water tank are seen behind the water tank.

As with viewpoint 1, the existing visual elements in viewpoint 2 generally provide a rural/semi-rural visual character. In terms of visual quality, the two existing mature trees provide some degree of vividness albeit generally low. Some of the developed elements are less visible from this view compared to viewpoint 2 due to these trees that partially screen views of the existing water tank and residential development; however, the roadways in the immediate foreground emphasize that the area contains both developed and undeveloped features that contribute to a low level of intactness and visual unity. Overall, the existing visual quality of viewpoint 2 is low.

Project Features Visible from Viewpoint 2. As shown in the simulations in Figure 8 (photographs 8b and 8c), visible project features from this viewpoint would include the new water tank, brow ditches, and landscaping. The new water tank would be constructed in front of the existing tank (Quail Valley Water Tank II) and is visible in the middle ground. Project landscaping would be installed on a manufactured slope in front of the new tank. Concrete brow ditches would be located at the ground level extending down the manufactured slope (pictured below the tank) and another one on the right side of the new water tank that would meander through the landscaped slope.

Change to Visual Character/Quality. The proposed project would cause a moderately low level of change to the existing visual character and quality of viewpoint 2. Existing views of the existing tank behind and in between the existing tree would be replaced with views of the new tank. The existing tree that partially screens the existing tank would be removed and the new tank would be constructed in front of the existing one. As a result, the new tank would be more visible than the existing one from this viewpoint because it would be closer to the view location (which would make it appear larger in scale) and there would be no mature tree to screen the tank. Trees would be panted around the tank and in time and upon full maturity (which can take more than 10 years), they would provide some screening of the tank similar to the existing condition. In the interim, the new tank would be a more prominent element viewed from this locale. However, the new tank would not represent a substantial change in the view over existing conditions because viewers currently see a water tank with vegetation in front of it and existing developed elements to the southeast with some ridgeline views in the background. The proposed view would also see these features in the same general physical arrangement. The proposed tank would be similar in size, shape, and color as the existing tank, and additional vegetation cover would be provided in front of it. As shown, the visual screening provided 10 years post construction (photograph 8b) would enhance the visual conditions of the site. Views of the ridgeline to the east, the developed features of the residential property to the southeast, and utility poles and overhead utility lines would remain. Although one of the existing mature trees would be removed, the one closest to the roadway (and viewpoint location) would remain and thus, vividness would remain generally low. The intactness and unity of the view would slightly be decreased with the introduction of a more visible developed element. Overall, the project would not substantially degrade the existing visual character or quality of viewpoint 2.

Other Visual Considerations

The City of Menifee's General plan states that the goal of development in Menifee is to: "Promote thoughtful hillside development that respects the natural landscape by designing houses that fit into the natural contours of the slope and sensitive development that preserves and protects important cultural and biological resources" (City 2013). The project fits into the natural contour of the hillside and is consistent with the existing visual character of two other tanks. Upon completion of construction, the water tank and related facilities would be visible from some areas immediately southwest and northwest of the site. These areas primarily comprise private vantage points such as residential and agricultural uses; public views would be available from the roadways within the residential developments. Views experienced from publicly accessible vantage points would include Goetz Road as well as the designated community bike lane along Goetz Road. The recreation trails off Quail Circle north of the project site is not a designated city trail; however, the Menifee Trails Committee has identified it as an important trail to connect to trails in the east. Views to the proposed facilities from these locations would be limited due to the topography and intervening structures and landscaping. Generally, the project site would comprise only a portion of expansive views for recreationalists using public trails at these locations. The neighborhoods south of the project would not be able to see the tank due to the topography of the area. The only other public views would be those of the residents on South Canyon Drive; however, due to the topography of the area, tanks are visible from only a section of South Canyon Drive on the southern side. Viewers from this area would be residents and have pre-existing expectations of viewing tanks due to the existing two tanks.

Relative to the visual character of the project site and surrounding area, the proposed facilities would be similar in scale and appearance to the existing water tanks located adjacent to the proposed tank. The tank would be set at an elevation lower than the adjacent hillside to the northeast and would not extend above the ridgeline. The project would not introduce a new visual element into the viewshed; the immediate area already includes similar water tanks and a pump station, and the addition of a third tank in the area would not result in a substantial change to the existing visual character or quality of the site for the reasons discussed above. Overall, the quality of public views of the site and its surroundings would not be substantially degraded and impacts would be less than significant.

d. **Less-Than-Significant Impact**. Project construction would occur during daylight hours, and no lighting associated with construction would be required. The proposed project would not result in a new substantial source of light. The proposed project would include the installation of security lighting as needed at the site during the long-term operation of the facilities. Security lighting would be similar in nature to the outdoor and street lighting of the existing residential neighborhood south of the property and would be angled down and shielded in accordance with the City guidelines (Municipal Code §6.01.040). Additionally, the proposed tank would not be constructed of materials that would create sources of glare and would not include highly reflective finishes. The proposed replacement transmission line and on-site detention basin would not include sources of light or glare. The project site is approximately 32 miles from the Palomar Observatory and is Zone B (15 to 45 miles) of the Mt. Palomar Nighttime Lighting Policy Area (Murietta 2004). While conformance to restrictions related to these zones would not be required for the project, the project would adhere to the applicable lighting standards established by the County (Ordinance No. 655) and the Menifee City Municipal Code (§6.01.020 and §6.01.040) (City 2020). Impacts associated with light and glare would be less than significant.

2. Agriculture and Forestry Resources

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	■
b. Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	■
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	■
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	■
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	■

Discussion

a. **No Impact**. The California Department of Conservation (DOC), Division of Land Resources Protection’s Farmland Mapping and Monitoring Program (DOC 2018) indicates that no Prime Farmland or Unique Farmland is located within the project site. The land directly across South Canyon Drive is classified as Farmland of Local Importance; however, the land is currently vacant and is not developed with agricultural uses. The project site is identified as Other Land, which is not suitable for agricultural purposes. Implementation of the proposed project would involve the construction and operation of an aboveground water storage tank, a detention basin, and related facilities on site, in addition to the replacement of a small portion of pipeline within South Canyon Drive. The project would not convert adjacent agricultural uses to non-agricultural use. No impact to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance would occur.

b. **No Impact**. There are no Williamson Act Contracts in Menifee (DOC 2016). As no agricultural uses or Williamson Act lands occur within the project site, no impact would occur.

c. **No Impact**. The project site is not designated or zoned for forest land, timberland, or timberland zoned Timberland Production. Therefore, implementation of the project would not conflict with existing zoning for such lands, and no impact would occur.

d. **No Impact**. As stated in Item 2.c, the project site is not located in an area designated as forest land. Accordingly, project construction and operation would not convert forest land to non-forest use, and no impact would occur.

e. **No Impact**. There are no timberland production operations within the project site or vicinity. The project does not propose changes that could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. No impact would occur.

3. Air Quality

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	■
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under the applicable federal or state ambient air quality standard?	☐	☐	■	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	■	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	■	☐

The following discussion is based on the Air Quality and Greenhouse Gas Emissions Technical Report written by HELIX Environmental Planning Inc (HELIX; 2022a), and is attached to this Initial Study/Mitigated Negative Declaration (IS/MND) as Appendix A.

Discussion

a. **No Impact**. The project is located within the South Coast Air Basin (Basin) under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). SCAQMD develops and administers local regulations for stationary air pollutant sources within the Basin, and also develops plans and programs to meet attainment requirements for both federal and State Ambient Air Quality Standards. SCAQMD and the Southern California Association of Governments (SCAG) are responsible for formulating and implementing the Air Quality Management Plan (AQMP) for the Basin (SCAQMD 2017), which is the applicable air quality plan for the project. SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, economy, community development, and environment. With regard to air quality planning, SCAG has prepared the RTP/SCS, a long-range transportation plan that uses growth forecasts to project trends out over a 20-year period to identify regional transportation strategies to address mobility needs. These growth forecasts form the basis for the land use and transportation control portions of the AQMP. These documents are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. Both the

RTP/SCS and AQMP are based, in part, on regional population and employment growth projections originating with County and City General Plans.

The project site is zoned and designated as PF (Public/Quasi Public Facilities) and would be developed in accordance with those land uses. Additionally, the project site already includes existing water tanks and associated facilities. Because the project is consistent with the local general plan and zoning, pursuant to SCAQMD guidelines, the proposed project is considered consistent with the region's AQMP. As such, proposed project-related emissions are accounted for in the AQMP, which is crafted to bring the Basin into attainment for criteria pollutants. Accordingly, the proposed project would be consistent with the projections in the AQMP, thus resulting in no impact.

b. **Less-Than-Significant Impact**. Air quality is defined by ambient air concentrations of six specific pollutants identified by the U.S. Environmental Protection Agency to be of concern with respect to health and welfare of the general public. These pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (including both particulate matter 10 microns or less in diameter [PM_{10}] and particulate matter 2.5 microns or less in diameter [$PM_{2.5}$]), sulfur dioxide (SO_2), and lead (Pb). The nonattainment status of regional pollutants is a result of past and present development within the Basin. The Basin is a federal and/or State nonattainment area for ozone, PM_{10}, and $PM_{2.5}$. In accordance with CEQA Guidelines Section 15064(h)(3), the SCAQMD's approach for assessing cumulative impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the federal and State Clean Air Acts. The Basin is currently in federal/state nonattainment for 1-hour ozone, 8-hour ozone, PM_{10}, and $PM_{2.5}$. As discussed in Item 3.a, the proposed project would be consistent with the AQMP, which is intended to bring the Basin into attainment for all criteria pollutants.

To determine whether a project would result in cumulatively considerable emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation, a project's emissions are evaluated based on the quantitative emission thresholds established by the SCAQMD (as shown in Table 9 of Appendix A). An analysis of criteria pollutants and precursors generated during short-term construction and long-term operation is provided below.

Construction

The project's construction emissions were estimated using the California Emissions Estimator Model (CalEEMod) model as described in Section 4.1.1 of Appendix A. See the Air Quality and Greenhouse Gas Technical Report for additional details of phasing, selection of construction equipment, and other input parameters, including CalEEMod data.

The results of the calculations for project construction are shown in Table 2, *Maximum Daily Construction Emissions*. The data are presented as the maximum anticipated daily emissions for comparison with the SCAQMD thresholds (SCAQMD 2019).

Table 2
MAXIMUM DAILY CONSTRUCTION EMISSIONS

Phase	ROG (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Demolition	2.9	25.1	23.8	<0.1	1.5	1.1
Site Preparation	2.6	24.0	19.3	<0.1	7.3	4.1
Grading	2.6	34.0	21.1	<0.1	8.8	4.5
Building Construction (2023)	2.3	18.9	19.3	<0.1	0.9	0.8
Building Construction (2024)	2.2	17.6	19.2	<0.1	0.8	0.7
Paving	0.8	7.2	11.5	<0.1	0.6	0.4
Architectural Coatings	3.3	1.2	1.8	<0.1	<0.1	<0.1
Maximum Daily Emissions	**3.3**	**34.0**	**23.8**	**0.1**	**8.8**	**4.5**
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Significant Impact?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix A)
lbs/day = pounds per day; ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

As shown in Table 2, construction period emissions of criteria pollutants and precursors would not exceed the SCAQMD significance thresholds, and impacts during construction would be less than significant.

Operations

Once construction activity is complete, there would be no long-term emissions associated with the project; the project would not result in increased vehicle trips or energy demand. Operational emissions generated from the proposed project would be limited to emissions associated with maintenance activities at the site and would be well below significance levels. Vehicle trips associated with the operation of the proposed project would include (on average) a minor number of trips from weekly maintenance and approximately daily security checks at the tank, and basin maintenance two to three times a year to clean or reform the basin. An average of eight round trips to the project site on a weekly basis would not generate significant emissions. Therefore, the proposed project would not violate air quality standards or contribute substantially to an existing or projected air quality violation. Impacts would be less than significant.

c. **Less-Than-Significant Impact**. California Air Resources Board (CARB) and the Office of Environmental Health Hazard Assessment (OEHHA) have identified the following groups of individuals as the most likely to be affected by air pollution: adults over 65, children under 14, infants (including in utero in the third trimester of pregnancy), and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis (CARB 2005; OEHHA 2015). Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved and are referred to as sensitive receptor locations. Examples of these sensitive receptor locations are residences, schools, hospitals, and daycare centers. For health risk assessments, the health impacts are analyzed for individual residents assumed to be standing in their primary outdoor spaces closest to the source of toxic air contaminates (TACs), for students assumed to be standing outside of the school buildings or in outdoor recreation areas closest to the source of TACs, and for individual off-site workers assumed to be standing outside of a commercial or industrial building.

The closest existing sensitive receptor location to the project site is the single-family residence immediately southwest of the project site. Additional residential sensitive receptors are located further to the west.

Construction

The localized effects from the on-site portion of daily construction emissions were evaluated at sensitive receptor locations potentially impacted by the project according to the SCAQMD's localized screening threshold (LST) method. The proposed project is within SRA 24, Perris Valley. Consistent with the LST guidelines, when quantifying mass emissions for localized analysis, only emissions that occur on site are considered. Emissions related to off-site delivery/haul truck activity and construction worker trips are not considered in the evaluation of construction-related localized impacts, as these do not contribute to emissions generated on a project site. The closest sensitive receptor is the single-family residence adjacent to the southwest corner of the project site. Therefore, the LSTs in SRA 24 for receptors located less than 82 feet (25 meters) are used for project sites greater than 5 acres. Table 3, *Maximum Localized Daily Construction Emissions*, shows the localized construction emissions.

Table 3
MAXIMUM LOCALIZED DAILY CONSTRUCTION EMISSIONS

Activity	NO_X (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Demolition	25.1	22.9	1.2	1.1
Site Preparation	24.0	18.4	7.0	4.0
Grading	25.1	17.9	7.3	4.1
Building Construction (2023)	18.8	19.2	0.8	0.8
Building Construction (2024)	17.6	19.0	0.7	0.7
Paving	7.1	10.8	0.3	0.3
Architectural Coatings	1.2	1.8	<0.1	<0.1
Maximum Daily Emissions	**25.1**	**22.9**	**7.3**	**4.1**
SCAQMD LST Thresholds (25 meters)	*270*	*1,577*	*13*	*8*
Exceed LST (25 meters)?	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix A)
lbs/day = pounds per day; NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter; LST = localized screening thresholds

As shown in Table 3, localized emissions for criteria pollutants would remain below their respective SCAQMD LSTs at 82 feet (25 meters). Therefore, construction of the project would not result in exposure of sensitive receptors to substantial localized concentrations of criteria pollutants and precursors.

Construction of the project would result in the use of heavy-duty construction equipment, haul trucks, and construction worker vehicles. These vehicles and equipment could generate the TAC diesel particulate matter (DPM). Generation of DPM from construction projects typically occurs in a localized area (e.g., at the project site) for a short period of time. Because construction activities and subsequent emissions vary depending on the phase of construction (e.g., grading, building construction), the construction-related emissions to which nearby receptors are exposed to would also vary throughout the construction period. During some equipment-intensive phases such as grading, construction-related emissions would be higher than other less equipment-intensive phases such as building construction. Concentrations of mobile-source DPM emissions are typically reduced by 70 percent at approximately 500 feet (CARB 2005).

The dose (of TAC) to which receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance in the environment and the extent of exposure a person has with the substance; a longer exposure period to a fixed quantity of emissions would result in higher health risks. Current models and methodologies for conducting cancer health risk assessments are associated with longer-term exposure periods (typically 30 years for individual residents based on guidance from OEHHA) and are best suited for evaluation of long duration TAC emissions with predictable schedules and locations. These assessment models and methodologies do not correlate well with the temporary and highly variable nature of construction activities. Cancer potency factors are based on animal lifetime studies or worker studies where there is consistent long-term exposure to the carcinogenic agent. There is considerable uncertainty in trying to evaluate the cancer risk from projects that will only last a small fraction of a lifetime (OEHHA 2015). Considering this information, the highly dispersive nature of DPM, and the fact that construction activities would occur at various locations and varying intensities throughout the project site, it is not anticipated that construction of the project would expose sensitive receptors to substantial DPM concentrations. Impacts would be less than significant.

Operations

Once construction activity is complete, there would be no long-term emissions associated with the project; the project would not result in increased vehicle trips or energy demand. Therefore, operation of the project would not result in a CO hotspot or DPM caused by a significant increase in operational vehicle trips. Operation of the project would not generate substantial pollutant concentrations; therefore, impacts would be less than significant.

d. **<u>Less-Than-Significant Impact</u>**. According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting activities, refineries, landfills, dairies, and fiberglass molding operations (SCAQMD 1993). The project, involving the construction of a potable water tank, would not include any of these uses nor are there any of these land uses in the project vicinity.

Emissions from construction equipment, such as diesel exhaust, and VOCs from architectural coatings and paving activities may generate odors; however, these odors would be temporary, intermittent, and not expected to affect a substantial number of people. Additionally, noxious odors would be confined to the immediate vicinity of construction equipment. Furthermore, short-term construction-related odors are expected to cease upon the drying or hardening of the odor-producing materials. Long-term operation of the project would not be a substantial source of objectionable odors. Therefore, the project would not create objectionable odors affecting a substantial number of people, and the impact would be less than significant.

4. Biological Resources

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	■
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	■	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	■	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	■	☐

A General Biological Resource Assessment Report was prepared for the project by HELIX (HELIX 2022b; Appendix B). The report documents the results of the biological resources study performed by HELIX for the project, which includes the results of database queries, literature reviews, and biological resources surveys. The results and conclusions of HELIX's biological resources technical study are summarized herein.

Discussion

a. **<u>Less Than Significant with Mitigation Incorporated</u>**. During the biological survey, the coastal California gnatcatcher (CAGN) was observed on site. This species is listed at the federal level.

Approximately 0.98 acre of Riversidean sage scrub and 1.38 acres of Riversidean sage scrub disturbed was found on site, which is suitable nesting habitat for the CAGN and other birds protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFG Code). Modification of this habitat could have an adverse effect on the CAGN and other migratory birds. Additionally, construction of the proposed project could result in noise or dust during the general bird nesting season that could have an adverse effect on the CAGN and other migratory birds. If this were to occur, such effects would violate the MBTA. Two raptor species were observed in flight at the project site (red-tailed hawk [*Buteo jamaicensis*] and American kestrel [*Falco sparverius*]) and several others have potential to forage in the project vicinity, however the project site does not provide high-quality raptor nesting habitat due to the limited number of trees, and existing residential and utility uses. The project site has a low potential to impact burrowing owls (*Athene cunicularia*) and does not have any current burrows; however, there is a small amount of the project site that meets most of the requirements for potential burrowing owl habitat. Impacts to the on-site CAGN and other migratory birds protected under the MBTA would be potentially significant. To avoid impacts to nesting birds, vegetation should be cleared between September 1 and February 14. If vegetation is to be cleared during the bird nesting season (February 15 through August 31), a pre-construction nesting bird survey would be required. If an active nest is detected, it shall be avoided and an appropriate buffer established until the nest is determined by the biologist to no longer be active. Standard buffer distances are 100 feet for common songbirds, 300 feet for sensitive bird species, and 500 feet for raptors and listed bird species. Implementation of mitigation measure BIO-1 would reduce potential impacts to CAGN which is covered under the MSHCP, to a less-than-significant level. To avoid possible impacts to burrowing owls, mitigation measure BIO-2 would be applied. Additionally, implementation of mitigation measure BIO-3 would ensure that potential impacts to birds protected under the MBTA and CFG Code are avoided during project construction. With implementation of mitigation measures BIO-1 though BIO-3, impacts to species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS) would be reduced to less than significant.

BIO-1 **MSHCP Mitigation Impact Fee.** Prior to construction, the Applicant shall pay the appropriate MSHCP mitigation fee in accordance with Section 6.1.6 of the MSHCP for Participating Special Entities or take other such actions as agreed upon in coordination with the Western Riverside County Regional Conservation Authority (RCA) and the Wildlife Agencies. The fees shall be either collected by, or submitted to, the RCA.

BIO-2 **Pre-Construction Burrowing Owl Survey.** A 30-day pre-construction survey for burrowing owls is required prior to initial ground-disturbing activities (e.g., vegetation clearing, clearing, and grubbing, grading, tree removal, site watering, equipment staging) to ensure that no owls have colonized the site in the days or weeks preceding the ground-disturbing activities. If burrowing owls have colonized the project site prior to the initiation of ground-disturbing activities, the project proponent will immediately inform the Regional Conservation Authority (RCA) and the Wildlife Agencies and will need to coordinate further with RCA and the Wildlife Agencies, including the possibility of preparing a Burrowing Owl Protection and Relocation Plan, prior to initiating ground disturbance. If ground-disturbing activities occur, but the site is left undisturbed for more than 30 days, a pre-construction survey will again be necessary to ensure that burrowing owl have not colonized the site since it was last disturbed.

BIO-3 Pre-Construction Nesting Bird Survey and Avoidance. Vegetation clearing should be conducted outside the nesting season, which is generally defined as February 15 to August 31. If vegetation clearing must take place during the nesting season, a qualified biologist shall be retained to perform a pre-construction survey for nesting birds. A pre-construction nesting bird survey would not be required unless direct impacts to vegetation are proposed to occur. The nesting bird survey shall occur no more than seven days prior to vegetation removal.

Additionally, raptors (birds of prey) are known to begin nest building in January or February. If vegetation clearing is to occur between January 1 and February 15, a nesting raptor survey shall be conducted within the project site, including a 500-foot buffer, no more than seven days prior to vegetation removal.

If active bird nests are confirmed to be present during the pre-construction survey, an appropriate buffer zone shall be established by a qualified biologist until a biologist has verified that the young have fledged or the nest has otherwise become inactive.

b. **Less Than Significant with Mitigation Incorporated**. The project site includes a small unnamed ephemeral drainage. The drainage originates east of the site as a natural drainage and consists of 0.048 acre and 423 linear feet of streambed, along with 0.01 acre and 35 linear feet of rip/rap at culvert outlets, and 0.01 acre and 198 linear feet of culvert. The drainage is the only water feature in the project site that qualifies as MSHCP Riparian/Riverine resources. This determination was based on the natural origin of the drainage. The project would replace and reconfigure the existing drainage system on site; therefore, resulting in permanent impacts to 0.048 acre streambed, along with 0.01 acre rip/rap, and 0.005 acre culvert. As discussed further in the project's General Biological Resource Assessment Report (Appendix B), this would result in impacts to 0.02 acre non-wetland waters of the U.S. jurisdictional to United States Army Corps of Engineers (USACE), 0.06 acre waters of the state jurisdictional to Regional Water Quality Control Board (RWQCB), 0.06 acre of streambed jurisdictional to CDFW, and 0.06 acre MSHCP Section 6.1.2 Riverine resources. These impacts would be required for the grading for the new tank, water detention basin, and associated infrastructure, and would be potentially significant; however, implementation of mitigation measure BIO-4 would reduce impacts on aquatic resources to a less-than-significant level and the project would be consistent with MSHCP Section 6.1.2.

Permanent impacts to 1.24 acres and temporary impacts to 0.09 acre of Riversidean sage scrub on site would be potentially significant. Additionally, off-site impacts would occur to 0.008 acre of Riversidean sage scrub as a result of grading activities along South Canyon Drive. The project design has been modified to minimize impacts to Riversidean sage scrub to the maximum extent feasible and implementation of mitigation measure BIO-1 (identified in Item 4.a) would reduce impacts to Riversidean sage scrub to a less-than-significant level. Additionally, the project would incorporate standard BMPs to help ensure the protection of sensitive habitat during project construction. Specific BMPs may include but would not necessarily be limited to maintaining the project work areas free of trash and debris; employing appropriate standard spill prevention practices and clean-up materials; installing and maintaining sediment and erosion control measures; maintaining effective control of fugitive dust; and properly storing, handling, and disposing of toxins and pollutants, including waste materials. Implementation of required BMPs in combination with mitigation measures BIO-1, BIO-4, and BIO-5 would ensure that construction activities are contained within the proposed work limits, and that potentially significant direct and indirect impacts on sensitive natural communities are reduced to less-than-significant levels. Temporary fencing would provide further protection to environmentally sensitive areas during construction (see mitigation measure BIO-6).

With the Incorporation of mitigation measures BIO-1 and BIO-4 through BIO-6, impacts to riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS would be reduced to less than significant.

BIO-4 Acquire Permits and Mitigation for Aquatic Impacts. Prior to project activities occurring within jurisdictional aquatic resources, the project proponent shall prepare for approval by the RCA, USFWS, and CDFW a Determination of Biologically Equivalent or Superior Preservation (DBESP) for impacts to MSHCP Section 6.1.2 riverine resources and shall also apply for and obtain the following regulatory permits and approvals from the USACE, RWQCB, and/or CDFW, as applicable:

- Clean Water Act Section 404 Permit;
- Clean Water Act Section 401 Water Quality Certification; and/or
- California Fish and Game Code Section 1602 Streambed Alteration Agreement.

The project proponent shall mitigate impacts to jurisdictional aquatic resources off site at a 2:1 ratio to include a minimum 1:1 establishment/re-establishment component through purchase of 0.06 acre of re-establishment credits and 0.06 acre of re-establishment or rehabilitation credits from the Riverpark Mitigation Bank, which is located within the MSHCP planning area and San Jacinto River watershed approximately 8.0 miles to the northeast of the impact site, unless otherwise required by the RCA, USFWS, USACE, RWQCB, and/or CDFW during project permitting.

BIO-5 Biological Monitor. Prior to construction, the District shall retain a qualified biologist to monitor clearing and/or grubbing activities. The biological monitor shall attend pre-construction meetings and be present during the removal of vegetation to ensure that the approved limits of disturbance are not exceeded and provide periodic monitoring of the impact area including, but not limited to, trenches, stockpiles, storage areas, and protective fencing. Before construction activities occur in areas containing sensitive biological resources, workers shall be educated by the biologist to recognize and avoid those areas that have been marked as sensitive biological resources.

BIO-6 Temporary Construction Fencing. Prior to construction, the District shall require that environmentally sensitive areas that occur outside of the approved work limits are identified on construction plans. Temporary construction fencing shall be installed along the approved work limits under the direction of the qualified biological monitor. Fencing shall be maintained and remain in place through the duration of project construction.

c. **No Impact**. The project would be restricted to upland areas that lack potential jurisdictional wetlands. Due to the lack of wetland plants and wetland waters of the U.S., no impacts to jurisdictional wetlands would occur.

d. **Less-Than-Significant Impact**. No known wildlife corridors or nursery sites occur on or in the immediate vicinity of the project site. The site is situated in the southwestern corner of a small range of hills. Undeveloped land occurs to the immediate north and east, and residential development occurs to the immediate south and west. Due to this location, the site does not provide a linkage or wildlife movement corridor between adjacent open space areas. The project's water tank and associated improvements would not preclude wildlife from moving through the local area unimpeded. Impacts would be less than significant.

e. **No Impact**. The study area is located within the City of Menifee which has public and private tree planting and removal ordinances that prohibit the removal of heritage trees or shrubs within public parks, public grounds, public streets, and other public and private areas without prior permission. Trees protected under these Heritage tree ordinances, such as eucalyptus species, occur on the project site. There is one eucalyptus tree that would be affected due to the grading of the detention basin. Per Section 9.86.120, "Heritage tree removal will require replacement with the largest nursery-grown tree(s) available as determined by the Community Development Department or Planning Commission. Heritage tree relocation to another location on the site is the preferred alternative to replacement subject to a written report by a landscape architect or ISA certified arborist on the feasibility of transplanting a heritage tree" (City 2015). The project Applicant would coordinate with the City for approval of the project's landscape design plan. With acceptance of the project landscape design plan impacts would be less-than-significant.

The proposed project is located within the Sun City/Menifee Valley Area Plan of the County's General Plan. Implementation of the project does not conflict with policies or conservation measures for biological resources. The proposed project site does not support sensitive natural communities outside of Riversidean sage scrub, nor does it support oak woodlands or riparian habitat. Riversidean sage scrub within the project footprint was found to have the ability to support CAGN. Impacts to Riversidean sage scrub are discussed in Items 4.a and 4.b. The project would be in compliance with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances, thus a less-than-significant impact would occur.

f. **Less-Than-Significant Impact**. The site is located within the Sun City/Menifee Valley Area Plan of the MSHCP. The MSHCP is a comprehensive multi-jurisdictional effort that includes western Riverside County and multiple cities. The District is not a participating entity under the MSHCP but is pursuing a PSE designation for the project site. Rather than address sensitive species on an individual basis, the MSHCP focuses on the conservation of 146 species, proposing a reserve system of approximately 500,000 acres and a mechanism to fund and implement the reserve system (Dudek 2003). Most importantly, the MSHCP allows participating entities to issue take permits for listed species so that individual applicants need not seek their own permits from the USFWS and/or CDFW. The MSHCP was adopted on June 17, 2003, by the Riverside County Board of Supervisors. The Incidental Take Permit was issued by the USFWS and CDFW on June 22, 2004.

As noted above, the project is located in the Sun City/Menifee Valley Area Plan of the MSHCP. The site is not within a subunit, Criteria Cell, or Cell Group, which are areas targeted for conservation. To obtain MSHCP coverage as a PSE, the project is required to demonstrate MSHCP compliance through specific habitat assessments, applicable biological surveys, and the provision of an MSHCP consistency analysis. As further described in the biological report, the project would be consistent with MSHCP polices and requirements; therefore, impacts would be less than significant.

5. Cultural Resources

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	☐	■
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	■	☐	☐
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	■	☐	☐

A Cultural Resources Survey was conducted for the project by HELIX (2022c; Appendix C). The cultural resources study area included the project site and land within a one-mile radius of the project footprint. The results and conclusions of the cultural resources assessment are summarized herein.

a. **No Impact**. HELIX staff obtained a records search of the California Historical Resources Information System at the Eastern Information Center on February 03, 2020. The records search covered the project site and a one-mile radius around it and included a review of archaeological and historical resource data, locations and citations for previous cultural resources studies, and a review of the State Office of Historic Preservation's historic properties directory. The records search identified 23 previous cultural resource studies within the records search limits, none of which are adjacent to or includes portions of the project APE.

According to the records search, five cultural resources have been previously recorded within a one-mile radius of the project, none of which are documented within the project site. A country club, an adobe-built residence, a wood frame house, a prehistoric lithic scatter, and an isolated chert biface (hard fine-grained sedimentary rock arrowhead) are located in the project vicinity. None of these previously recorded resources are within a half mile of the project area.

The results of the record search conducted for the project indicated that no properties were currently listed on the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR), historical resources, or historic landmarks recorded within or immediately adjacent to the project area. No potentially significant cultural resources of historic age were observed within or immediately adjacent to the project site during the historic photograph investigation conducted for the project. Therefore, no substantial adverse changes to the significance of historical resources within the project vicinity are anticipated and no impact would occur.

b. **Less Than Significant with Mitigation Incorporated**. As discussed in Item 5.a, five previously recorded cultural resources have been identified within a one-mile radius of the cultural resources study area. The Sacred Lands File search results were received from the Native American Heritage Commission (NAHC) on February 12, 2020. The search was negative for Sacred Lands within the project vicinity. Letters were sent by certified mail on February 12, 2020 to the tribal contacts indicated by the NAHC. Five responses have been received to date.

The response from the Pechanga Band of Luiseño Indians (Pechanga) received March 17, 2020 indicated that the project is in proximity to a known Traditional Cultural Property (TCP). The project is less than three miles from the Tribe's reservation and less than a mile and a half from a registered TCP. Due to this, Pechanga requests to be involved in consultation, receive copies of applicable archaeological reports, site records, proposed grading plans and environmental documents, and have a professional Pechanga tribe monitor to accompany the Riverside County archaeologist during earthmoving activities (see mitigation measure CUL-3). The response from Soboba Band of Luiseño Indians (Soboba) received March 18, 2020, noted that areas of potential impact were identified during an in-house database search, as well as being within the Tribe's Traditional Use Area (TUA). As a result of this, Soboba requests to be involved in consultation, receive copies of all cultural documents, and have a Native American Monitor(s) from the Soboba Cultural Resource Department present during ground-disturbing proceedings including surveys and archaeological testing (see mitigation measure CUL-3). The Rincon Band of Luiseño Indians (Rincon) indicated that the project area was within the Tribe's specific area of Historic Interest in a response received March 10, 2020. Rincon recommended an archaeological records search and requested a copy of the results when completed. The Agua Caliente Band of Cahuilla Indians responded that the location is within the tribes TUA, and therefore requested copies of the records search as well as any cultural documentation pertaining to this project. The Morongo Band of Mission Indians had no comment on the project.

An intensive pedestrian survey was undertaken by HELIX archaeologist Julie Roy and Soboba tribal cultural monitor Victoria Banda on April 19, 2021. The survey did not identify cultural resources within the APE; therefore, no impacts to cultural resources are anticipated. While no cultural resources have been identified within the APE, one prehistoric site and one prehistoric isolate have been recorded within a mile of the project area. In addition, the area is sensitive for cultural resources, as noted by the Tribes above. Based on this cultural sensitivity and the fact that soils eroding downslope from the nearby foothills may have obscured sites within the APE, it is recommended that an archaeological and Native American monitoring program be implemented to reduce potential impacts to less than significant. Mitigation measures CUL-1 through CUL-5 will be implemented to reduce potential impacts to below a level of significance:

CUL-1 **Cultural Resources Treatment and Monitoring Agreement.** At least 30 days prior to the start of ground-disturbing activities, Eastern Municipal Water District shall contact the Consulting Tribe(s) to develop Cultural Resource Treatment Monitoring Agreement(s) ("Agreement"). The Agreement(s) shall address the treatment of archaeological resources inadvertently discovered on the project site; project grading; ground disturbance and development scheduling; the designation, responsibilities, and participation of tribal monitor(s) during grading, excavation, and ground-disturbing activities; and compensation for the tribal monitors, including overtime, weekend rates, and mileage reimbursements.

CUL-2 **Cultural Resources Monitoring Plan Development.** Prior to grading activities, a Cultural Resources Monitoring Plan shall be prepared by a qualified archaeologist in consultation with the Consulting Tribe(s). The plan shall also identify the location and timing of cultural resources monitoring. The plan shall contain an allowance that the qualified archaeologist, based on observations of subsurface soil stratigraphy or other factors during initial grading, and in consultation with the Native American monitor and the lead agency, may reduce or discontinue monitoring as warranted if the archaeologist determines that the possibility of encountering archaeological deposits is low. The plan shall outline the appropriate measures to be followed in the event of unanticipated discovery of cultural resources during project implementation (including during the survey to occur following vegetation removal and monitoring during ground-disturbing activities). The plan shall identify avoidance as the preferred manner of mitigating impacts to cultural resources. The plan shall establish the criteria utilized to evaluate the historic significance (per CEQA) of the discoveries, methods of avoidance consistent with CEQA Guidelines Section 15126.4(b)(3), as well as identify the appropriate data recovery methods and procedures to mitigate the effect of the project if avoidance of significant historical or unique archaeological resources is determined to be infeasible. The plan shall also include reporting of monitoring results within a timely manner, disposition of artifacts, curation of data, and dissemination of reports to local and state repositories, libraries, and interested professionals. A qualified archaeologist and Consulting Tribe(s) tribal monitor shall attend a pre-grade meeting with Eastern Municipal Water District staff, the contractor, and appropriate subcontractors to discuss the monitoring program, including protocols to be followed in the event that cultural material is encountered.

CUL-3 **Tribal Monitoring Agreements.** A qualified archaeological monitor and a Consulting Tribe(s) monitor shall be present for ground-disturbing activities associated with the project, and both the project archaeologist and Tribal Monitor(s) will make a determination as to the areas with a potential for encountering cultural material. At least seven business days prior to project grading, Eastern Municipal Water District shall contact the tribal monitors to notify the Tribe of grading/excavation and the monitoring program/schedule, and to coordinate with the Tribe on the monitoring work schedule. Both the archaeologist and the tribal monitor shall have the authority to stop and redirect grading activities in order to evaluate the nature and significance of any archaeological resources discovered within the project limits. Such evaluation shall include culturally appropriate temporary and permanent treatment pursuant to the Cultural Resources Treatment and Monitoring Agreement, which may include avoidance of cultural resources, in-place preservation, data recovery, and/or reburial so the resources are not subject to further disturbance in perpetuity. Any reburial shall occur at a location predetermined between Eastern Municipal Water District and the Consulting Tribe(s), details of which shall be addressed in the Cultural Resources Treatment and Monitoring Agreement in MM CR-1. Treatment may also include curation of the cultural resources at a tribal curation facility, as determined in discussion among Eastern Municipal Water District, the project archaeologist, and the tribal representatives and addressed in the Cultural Resources Treatment and Monitoring Agreement referenced in MM CR-1.

CUL-4 **Evaluation of Discovered Artifacts**. Artifacts discovered at the development site shall be inventoried and analyzed by the project archaeologist and tribal monitor(s). A monitoring report will be prepared, detailing the methods and results of the monitoring program, as well as the disposition of cultural material encountered. If no cultural material is encountered, a brief letter report will be sufficient to document monitoring activities.

CUL-5 **Disposition of Inadvertent Discoveries.** In the event that Native American cultural resources are recovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries with the Tribe. The

District shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts and non-human remains as part of the required mitigation for impacts to cultural resources, and adhere to the following:

1) Preservation-in-place is the preferred option; preservation-in-place means avoiding the resources and leaving them in the place where they were found with no development affecting the integrity of the resource.

2) If preservation-in-place is not feasible, on-site reburial of the discovered items as detailed in the Monitoring Plan required pursuant to MM CR-2 is the next preferable treatment measure. This shall include measures and provisions to protect the future reburial area from future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments.

3) In the event that on-site reburial is not feasible, Eastern Municipal Water District will enter into a curation agreement with an appropriate qualified repository within Riverside County that meets federal standards per 36 Code of Federal Regulations 800 Part 79 and therefore would be curated and made available to other archaeologists/ researchers for further study. The collections and associated records shall be transferred, including title, to an appropriate curation facility within Riverside County, to be accompanied by payment of the fees necessary for permanent curation.

c. **Less Than Significant with Mitigation Incorporated**. No evidence of human remains, including those interred outside of formal cemeteries, was identified during the records search, literature review, or field survey. While no human remains are anticipated to be discovered during project construction, in the unexpected event that human remains are encountered during construction, related impacts would be potentially significant. In the unlikely event that human remains are discovered, the County Coroner shall be contacted. If the remains are determined to be of Native American origin, the Most Likely Descendant, as identified by the NAHC, shall be contacted in order to determine proper treatment and disposition of the remains. Requirements of Health & Safety Code §7050.5 and PRC §5097.98 shall be followed. Implementation of mitigation measure CUL-6 and CUL-7 would reduce potential impacts to less than significant.

CUL-6 Non-Disclosure of Reburial Locations. It is understood by all parties that unless otherwise required by law, the site of any reburial of culturally sensitive resources shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The coroner, pursuant to the specific exemption set forth in California Government Code 6254(r), parties, and Lead Agencies will be asked to withhold public disclosure information related to such reburial.

CUL-7 Procedure for Discovery of Human Remains. If Native American human remains are encountered, Public Resources Code Section 5097.98 and California Health and Safety Code Section 7050.5 will be followed. If human remains are encountered no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the coroner shall contact the NAHC within 24 hours. Subsequently, the NAHC shall identify the person or persons it believes to be the "most likely descendant." The most likely descendant shall then make recommendations and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.

6. Energy

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	■	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	■

Discussion

a. **<u>Less-Than-Significant Impact</u>**. Energy used for construction would primarily consist of fuels in the form of diesel and gasoline. Fuel consumed by construction equipment would be the primary energy resource expended over the course of construction and would include the transportation of construction materials and construction worker commutes. Heavy-duty construction equipment associated with construction activities, haul trucks involved in the removal of construction and demolition materials, and smaller support equipment (such as lighting, air compressors, and pumps) would consume petroleum-based fuel. Construction workers would travel to and from the project site throughout the duration of construction, presumably in gasoline-powered vehicles. While construction activities would consume petroleum-based fuels, consumption of such resources would be temporary and would cease upon the completion of construction. In addition, the project would implement BMPs and mobile equipment energy usage during construction would be minimized as the project would comply with CARB idling regulations, which restrict idling diesel vehicles and equipment to five minutes. The petroleum consumed during project construction would also be typical of similar construction projects and would not require the use of new petroleum resources beyond what are typically consumed in California. Based on these considerations, construction of the project would not result in wasteful, inefficient, or unnecessary consumption of energy resources.

During operations, the tank would use electricity for pumping water. Additional minor sources of energy use include maintenance worker vehicle trips and security lighting. The use of electricity would be restricted to necessary tank operations. The project would therefore not use energy in a wasteful, inefficient, or unnecessary manner. Implementation of the project would not result in a substantial increase in demand of local or regional energy supplies compared to existing conditions, and impacts would be less than significant.

b. **No Impact**. The project would be built and operated in accordance with existing, applicable regulations, which include, but are not limited to, the California Green Building Standards Code and CARB regulations such as idling limitations. Construction equipment and tank operation equipment would be maintained to allow for continuous energy-efficient operations. The project would therefore not conflict with the County's Climate Action Plan (County 2019), and no impacts would occur.

7. Geology and Soils

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	■	☐
ii. Strong seismic ground shaking?	☐	☐	■	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
iv. Landslides?	☐	☐	☐	■
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	■	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	■	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	■
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	■	☐	☐

The following information is based on the Geotechnical Study performed by Albus-Keefe and Associates (AK) for the proposed construction of Quail Valley Tank III (AK 2020) and is attached to this IS/MND as Appendix D.

Discussion

Menifee lies in the northern part of the Peninsular Ranges Geomorphic Province, which is characterized by northwest-trending mountains and valleys extending from the Los Angeles Basin on the north southeast into Baja California. The northern, onshore part of the province is divided into three major fault-bounded blocks that are, from west to east, the Santa Ana Mountains block, the Perris block, and the San Jacinto Mountains block. The Perris block, where Menifee is located, is bounded by the Elsinore fault zone on the southwest and the San Jacinto fault zone on the northeast. The alluvial (water-transported) fans of the Menifee area have a range of ages coincident with the rise of the nearby mountains (early Pleistocene to Holocene, approximately 1 million years to less than 11,000 years old).

Compacted artificial fill materials associated with previous site grading of the reservoir site in 2004 generally underlies the access road to the existing tank pad and underlies the level graded pad and associated access road in the south-central margin of the site. The compacted artificial fill materials were generally derived from on-site earth materials and are generally comprised of brown sand silt with gravel to silty gravel with various amounts of cobbles. Metasedimentary rocks assigned to the Jurassic age Bedford Canyon Formation underlies the entire site. Colluvial soil deposits are present within the bottom of the drainage swale that extends through the lower central portion of the site. The soil types on the project site are Lodo rocky loam, 20 to 50 percent slopes, eroded, Ysidora very fine sandy loam, 2 to 15 percent slopes, eroded, and Ysidora gravelly very fine sandy loam, 8 to 25 percent slopes, eroded. These deposits are dry to damp, soft and/or loose, and are porous. The thickness of the colluvial soil deposits encountered varies from 3 feet to 4.5 feet.

a.i. **<u>Less-Than-Significant Impact</u>**. The project site is located near several major faults, including the San Andreas, Elsinore, and the San Jacinto fault zones. The closest fault located approximately seven miles southwest of the project site is the Wildomar Fault located in the Elsinore Fault Zone. The San Jacinto Fault zone is located approximately 14 miles northeast of the project site (see Figure 6-3 of City 2006a). There are no known active faults projecting toward or extending across the project site. While the potential for on-site rupture cannot be completely discounted (e.g., unmapped faults could conceivably underlie the site), the likelihood for such an occurrence is considered low due to the absence of known faulting within or adjacent to the project site. No active faults are known to project through the site nor does the site lie within the bounds of an "Earthquake Fault Zone" as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act. As such, the potential for ground rupture due to a fault displacement beneath the site is considered remote. Impacts related to fault rupture from implementation of the proposed project would be less than significant.

a.ii. **<u>Less-Than-Significant Impact</u>**. The project site is located in a seismically active region and is likely to be subjected to moderate to strong seismic ground shaking. Seismic shaking at the site could be generated by events on any number of known active and potentially active faults in the region, including the Elsinore, San Jacinto, or San Andreas Fault zones. Faulting in the region generally comprises a number of northwest-trending, predominantly right-lateral strike-slip faults at the boundary between the Pacific and North American tectonic plates. An earthquake along any of these known active fault zones could result in severe ground shaking and consequently cause injury and/or property damage in the project vicinity. The site lies in relatively close proximity to several active faults; therefore, during the life of the proposed improvements, the property would probably experience similar moderate to occasionally high ground shaking from these fault zones, as well as some background shaking from other seismically active areas of the Southern California region. Design and construction in accordance with current design practices and codes are anticipated to adequately alleviate issues related to potential ground shaking.

The proposed tank and associated structures would be designed and constructed pursuant to applicable AWWA standards and District guidelines. Steel tanks that are designed and constructed in accordance with AWWA Standards have an excellent safety and performance track record and are the industry norm for water storage. The project design would also incorporate measures to accommodate seismic loading, as applicable, pursuant to existing guidelines such as the "Greenbook" Standard Specifications for Public Works Construction (Greenbook Committee of Public Works Standards, Inc. 2015) and the International Building Code (IBC; International Conference of Building Officials 2012). These guidelines are produced through joint efforts by industry groups to provide standard specifications for engineering and construction activities, including measures to accommodate seismic loading parameters. The referenced guidelines, while not comprising formal regulatory requirements per se, are widely accepted by regulatory authorities and are regularly included in related standards such as municipal building and grading codes. In addition, the project design would follow guidelines within the California Building Code (CBC; California Code of Regulations, Title 24, Part 2, 2019). The CBC is based on the previously described IBC, with appropriate amendments and modifications to reflect site-specific conditions in California. Furthermore, the District regularly monitors (both remotely and by daily observations) water storage facilities for leaks and repairs them immediately to avoid conditions that might result in a failure. Based on the incorporation of routine maintenance and applicable measures for project design and construction, the potential impacts associated with strong seismic ground shaking are assessed as less than significant.

a.iii. **Less-Than-Significant Impact**. Liquefaction is the phenomenon that occurs during severe ground shaking whereby soils reduce greatly in strength and temporarily behave similarly to a fluid. Engineering research of soil liquefaction potential (Youd, et al., 2001) indicates that generally three basic factors must exist concurrently in order for liquefaction to occur. These factors include:

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

Severe or extended liquefaction can result in significant effects to surface and subsurface facilities through the loss of support and/or foundation integrity. The site could be subjected to strong ground shaking and the site is underlain by layers of granular soils. However, materials within the influence of the proposed site development are anticipated to be adequately dense to greatly reduce the risks associated with liquefaction. In addition, current and future groundwater levels are anticipated to remain at great depth such that soils within the influence of the proposed tank are not expected to become saturated. As such, risks associated with liquefaction are considered remote. The project would be built according to industry and CBC standards and would not involve habitants of the project site. There would be people on site temporarily during construction, and then periodically for maintenance and security during operations. Because of the low risk of loss, injury, or death, the impacts would be less than significant.

a.iv. **No Impact**. The project site is in an area with potentially little to no earthquake-induced landslides (Figure 13 in the Sun City/Menifee Area Plan). According to the project's Geotechnical Report (see Appendix D), no evidence of landslides was identified within or adjacent to the subject site during previous investigations or previous grading of the site. As described above in 7.a.ii, however, the proposed tank and associated structures would be designed and constructed pursuant to applicable standards and guidelines. No impact would occur.

b. **Less-Than-Significant Impact**. Earthwork and construction activities associated with the proposed project would result in an increased potential for soil erosion at the project site. Grading of the site would involve 6,105 cubic yards of cut, 28,741 cubic yards of fill, for a net fill of 22,636 cubic yards. According to the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey, the site consists of Lodo rocky loam, 25 to 50 percent slopes, eroded, Ysidora very fine sandy loam, 2 to 15 percent slopes, eroded and Ysidora gravelly very fine sandy loam, 8 to 25 percent slopes, eroded.

A poorly- to moderately-developed topsoil of 0.5 foot to 2 feet deep mantles most of the bedrock beneath the undeveloped portions of the site. Substantial portions of the site materials and suitable import materials are anticipated to be relatively cohesionless. As such, many of the constructed fill slopes would be prone to surficial erosion during periods of rain. Erosion and sedimentation are not considered to be significant long-term concerns for the proposed project, as developed areas would be stabilized through efforts such as revegetation. Erosion potential would be higher in the short-term during construction than in pre-construction conditions. The project site is in an area of low slope instability (see Figure 13 in the Sun City/Menifee Area Plan). Erosion and sedimentation control measures would be implemented to minimize on-site erosion and off-site transport of eroded materials during project construction. Such control measures would include applicable BMPs as identified in sources including the Stormwater Best Management Practice Handbooks (California Stormwater Quality Association 2015) and/or Construction Site Best Management Practices Manual (Caltrans 2003), in addition to specific BMPs determined by the project contractor and engineer based on site-specific conditions. BMPs may include erosion control/stabilizing measures in cleared areas and on graded slopes (e.g., geotextiles, mats, fiber rolls, soil binders, temporary hydroseeding); sediment controls (e.g., temporary inlet filters, silt fences, fiber rolls, gravel bags, temporary sediment basins, check dams, street sweeping, energy dissipaters); and stabilized construction access points (e.g., temporary gravel or pavement) and sediment stockpiles (e.g., silt fences and tarps). Implementation of these measures would ensure potential erosion and sedimentation impacts remain less than significant. Additional erosion control measures may also be required in association with National Pollutant Discharge Elimination System (NPDES) permit requirements, as discussed below in Item 10.c.i.

c. **Less-Than-Significant Impact.** As discussed in Item 7.a.iii, the project site is not located within an area prone to liquefaction. No evidence of landslides was identified within or adjacent to the subject site during investigations or during previous grading of the site (see Items 7a.ii and 7a.iv.). The project itself would not cause local soil or geologic units to become unstable nor is construction of the project anticipated to cause on- or off-site land sliding, lateral spreading, subsidence, liquefaction, or collapse. Earthwork and grading should be performed in accordance with applicable requirements of the California Division of Occupational Safety and Health (CAL/OSHA) and the County's Grading Code, in addition to recommendations presented in the Geotechnical Report (AK 2020). Incorporation of standard engineering guidelines would ensure that effects related to unstable geologic units or soils would be less than significant.

d. **Less-Than-Significant Impact**. Expansive soils are generally high in clays or silts that shrink or swell with variation in moisture. Expansive (or shrink-swell) behavior is attributable to the water-holding capacity of clay minerals and can adversely affect the structural integrity of facilities including underground pipelines. The majority of the project site is characterized by Lodo rocky loam, a somewhat excessively drained soil with low clay content (NRCS 2020). The project site also contains Ysidora very fine sandy loam and Ysidora gravelly very fine sandy loam; both soil types are low in clay contents and are moderately well drained. Additionally, the proposed project would incorporate standard engineering techniques in accordance with the IBC and CBC to avoid adverse effects of expansive soils. Therefore, impacts related to expansive soils would be less than significant.

e. **No Impact**. Septic tanks or other alternative wastewater disposal systems would not be a part of the proposed project. No impact would occur.

f. **Less-Than-Significant Impact With Mitigation Incorporated.** The County General Plan Paleontological Sensitivity Map identifies the project site as being located within an "Undetermined" area of paleontological sensitivity (County 2003). The colluvium (Qcol) soil deposits on the site are not known to have paleontological sensitivity and the compacted artificial fill (Qcaf) has little to no paleontological sensitivity. Geologic units beneath the site consist predominately of Jurassic-age metasedimentary rocks assigned to the Bedford Canyon Formation (Jbc). This geologic formation is considered potentially sensitive for paleontological resources. Ground-disturbing activities associated with construction in the areas underlain by the Bedford Canyon Formation (Jbc) have the potential to uncover paleontological resources. If such resources were encountered, impacts would be potentially significant. Implementation of mitigation measure GEO-1 would ensure that impacts would be reduced to less than significant.

GEO-1 Paleontological Monitor. Excavation into areas of bedrock assigned to the Bedford Canyon Formation (Jbc) per the U.S. Geological Survey Geologic Map of the Romoland 7.5-minute Quadrangle, Riverside County, California shall be monitored by a qualified paleontologist. If paleontological resources are encountered, the paleontological monitor shall have the authority to temporarily halt or redirect work while the paleontological resources are documented and assessed. If significant deposits are found, additional data recovery shall be conducted, as necessary, in order to adequately mitigate project impacts. The fossil collection and all associated documentation shall be legally transferred to a qualified repository within Riverside County. Full-time paleontological monitoring can be reduced to part-time inspections or ceased entirely if determined adequate by the qualified paleontologist.

8. Greenhouse Gas Emissions

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	□	□	■	□
b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	□	□	□	■

The following discussion is based on the Air Quality and Greenhouse Gas Emissions Technical Report (HELIX 2022a) written by HELIX, and is attached to this IS/MND as Appendix A.

Discussion

Menifee is a member city of SCAG. SCAG's Connect SoCal 2020–2045 RTP/SCS (RTS/SCS), adopted September 3, 2020, is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The RTP/SCS embodies a collective vision for the region's future and is developed with input from local governments, county transportation commissions, tribal governments, nonprofit organizations, businesses, and local stakeholders in Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties.

Riverside County developed a Climate Action Plan (CAP) that was first adopted in December 2015 (County 2015). The 2019 CAP Update was approved on December 17, 2019 (County 2019). The 2019 CAP Update refines the County's efforts to meet greenhouse gas (GHG) reduction strategies, specifically for the years 2035 and 2050. The 2019 CAP Update builds upon the GHG reduction strategies in the 2015 CAP. The implementation of the CAP will also help lead agencies to assess cumulative impacts of a project and provide a means for future projects to address GHG impacts under CEQA.

Since the 2015 CAP adoption, new legislation and several policies have been proposed, such as Executive Order B-30-15 and Senate Bill (SB) 32 that extended the goals of Assembly Bill (AB) 32 and set a 2030 goal of reducing emissions to 40 percent below 1990 levels by 2030. Further, the emissions reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to make it possible to reach the goal of reducing emissions 80 percent below 1990 levels by 2050. The 2019 CAP Update re-evaluates the County's GHG reduction targets and strategies. The new goals and supporting measures are proposed to reflect and ensure compliance with changes in the local and State policies and regulations such as SB 32 and California's 2017 Climate Change Scoping Plan.

To reach the reduction target, the County has included additional local reduction measures in the CAP that encourage energy efficiency and renewable energy in buildings, transit-oriented planning, water conservation, and increased waste diversion.

a. **<u>Less-Than-Significant Impact</u>**. Global climate change refers to changes in average climatic conditions, including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, and certain hydro-fluorocarbons. These gases, known as greenhouse gases (GHGs), allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. GHGs are emitted by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Emissions of GHGs in excess of natural ambient concentrations are thought to be responsible for the enhancement of the greenhouse effect and contributing to what is termed "global warming," the trend of warming of the Earth's climate from anthropogenic activities. Global climate change impacts are by nature cumulative, as direct impacts cannot be evaluated due to the fact that the impacts themselves are global rather than localized impacts.

Construction

The project's construction-related GHG emissions were estimated using the CalEEMod model as described in Item 3. Project-specific input was based on general information provided in Item 2 and default model settings to estimate reasonably conservative conditions. Additional details of phasing, selection of construction equipment, and other input parameters are included in Appendix A.

Emissions of GHGs related to the construction of the project would be temporary. As shown in Table 4, *Estimated Construction Greenhouse Gas Emissions*, total GHG emissions associated with construction of the project are estimated at 783.4 metric tons (MT) of carbon dioxide equivalent (CO_2e). For construction emissions, SCAQMD Riverside County guidance recommends that the emissions be amortized (i.e., averaged) over 30 years and added to operational emissions. Averaged over 30 years, the proposed construction activities would contribute approximately 26.1 MT CO_2e emissions per year.

Table 4
ESTIMATED CONSTRUCTION GREENHOUSE GAS EMISSIONS

Year	Emissions (MT CO_2e)
2023	501.8
2024	281.6
TOTAL[1]	**783.4**
Amortized Construction Emissions[2]	*26.1*

Source: CalEEMod (output data is provided in Appendix A)
[1] Totals may not sum due to rounding.
[2] Construction emissions are amortized over 30 years in accordance with Riverside County guidance.
MT = metric tons; CO2e = carbon dioxide equivalent

Operations

Once construction activity is complete, there would be minimal long-term GHG emissions associated with the project. Maintenance vehicle trips are not anticipated to increase beyond what is currently required for maintenance of on-site infrastructure. Operational emissions would result from the use of electricity for pumping water and security lighting. These emissions, however, would be negligible and in combination with the project's amortized construction emissions of 26.1 MT CO_2e emissions per year would be substantially below the County of Riverside's CAP GHG screening threshold of 3,000 MT CO_2e per year. Therefore, impacts would be less than significant.

b. **No Impact**. As discussed in Item 8.a, the proposed project would result in negligible GHG emissions. The proposed project would not result in emissions that would adversely affect state-wide attainment of GHG emission reduction goals as described in AB 32, Executive Order S-21-09, and Senate Bill 32. Project emissions would therefore have a less than cumulatively considerable contribution to global climate change impacts, and the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. No impact would occur.

9. Hazards and Hazardous Materials

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	■	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	■	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	■
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	■	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	■
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	■	☐
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	■	☐	☐

Discussion

a. **Less-Than-Significant Impact**. During the project construction period, hazardous substances used to maintain and operate construction equipment (such as fuel, lubricants, adhesives, solvents, and asphalt) would be present. The use or generation of such construction-related hazardous materials could potentially result in significant impacts through accidental discharge associated with use, storage, operation, and maintenance activities. The transport, use, and disposal of hazardous materials would be conducted in accordance with applicable federal and state laws, including the Hazardous Materials Transportation Act and California Code of Regulations, Title 22, Division 4.5. In addition, implementation of the proposed project would require conformance with the NPDES Construction General Permit (Order 2009-0009-DWQ). Such conformance would entail implementation of a Storm Water Pollution Prevention Program (SWPPP) to address the discharge of contaminants (including construction-related hazardous materials) through appropriate BMPs including, but not limited to, establishing designated vehicle fueling areas away from drainages, ensuring vehicles are equipped with spill kits, and inspecting on-site vehicles and equipment daily for leaks. While specific BMPs would be determined during the SWPPP process based on site-specific characteristics (equipment types, etc.), they would include standard industry measures and guidelines contained in the NPDES Construction General Permit text. Based on implementation of appropriate BMPs to provide conformance with the NPDES Construction General Permit, potential impacts associated with construction-related hazardous materials would be less than significant. Operations of the project would not include transport, handling, or disposal of hazardous materials; therefore, impacts during operations would be less than significant.

b. **Less-Than-Significant Impact**. As discussed above in Item 9.a, project construction would require the use of hazardous materials, which could be at risk of release through upset and/or accident conditions. The potential for release would be minimized through implementation of a CAL/OSHA Construction Safety Plan and a hazard communication program during construction, as required under Section 5194 of the California Code of Regulations. The hazard communication program would include disclosure of the hazardous materials present on site, labels for hazardous materials containers, safety data sheets (with information on the health effects of hazardous materials), and employee training on hazardous materials handling. In the event of an accidental release of hazardous substances, the project would comply with Code of Federal Regulations Section 1910.120, which outlines protocol for hazardous waste clean-up operations and emergency response. Operations of the project would not require the use of hazardous materials. Through compliance with regulations and procedures, the project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials, and impacts would be less than significant.

c. **No Impact**. The closest schools to the project site are Quail Valley Elementary School, approximately one mile to the southwest, and Ridgemoor Elementary School, approximately one mile to the southeast. No existing or proposed school facilities are located within 0.25 mile of the project site. Therefore, no impact associated with hazardous materials would occur to schools.

d. **Less-Than-Significant Impact**. Pursuant to Government Code §65962.5 (Cortese List) requirements, the State Water Resources Control Board (SWRCB) GeoTracker database and the California Department of Toxic Substances Control EnviroStor database were searched for hazardous materials sites in the project site and vicinity. The results of these searches indicated that no listed hazardous material sites are located within or adjacent to the project site. The following listings are located in the general site vicinity:

- A leaking underground storage tank (LUST) cleanup site is associated with the Canyon Lake east boat launch on Goetz Road, approximately 0.4 mile west of the project site. Cleanup activities have been completed and the site was closed as of February 2002.

- Another LUST cleanup site is associated with the Circle K gas station on Goetz Road, approximately 0.9 mile southwest of the project site. Cleanup activities have been completed and the site was closed as of July 2003.

Given the scale and distance of this site from the proposed project, it does not represent a hazards concern for the project. Accordingly, impacts related to hazardous materials sites would be less than significant.

e. **No Impact**. The project site is located approximately five miles south of Perris Valley Airport-L65. The proposed facilities would not be located within a mapped Compatibility Zone; therefore, the proposed project would not result in a safety hazard to the construction or maintenance workers. No impact would occur.

f. **Less-Than-Significant Impact**. The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Construction vehicles and equipment accessing the site would use Goetz Road to access the project site via South Canyon Drive. A small portion of South Canyon Drive may be temporarily closed during the proposed pipeline replacement within the right-of-way; however, traffic detours or diversions would continue to allow ingress/egress from the project area. As such, the project would not inhibit access to hospitals, emergency response centers, school locations, communication facilities, highways and bridges, or airports. Potential impacts to emergency response or evacuation plans from the proposed project would be less than significant.

g. **Less Than Significant With Mitigation Incorporated**. The project site is designated as a "Very High Fire Hazard Severity Zone" (VHFHSZ) within a "Local Responsibility Area" (LRA) according to the California Department of Forestry and Fire Protection (CAL FIRE) FHSZ viewer (CAL FIRE 2020) and the Western Riverside County LRA map (CAL FIRE 2009). The proposed project does not include habitable structures that could expose people to a significant risk of loss, injury, or death involving wildland fires. Furthermore, the presence of employees at the project site would be limited to periodic maintenance and security checks. No employees would work at the site on a daily basis or for long periods of time. While the proposed water tank and related facilities could be exposed to risks associated with wildland fires, the project would comply with Chapter 49 of the California Fire Code, which requires hazardous vegetation and fuels management, as well as adequate defensible space around structures within the VHFHSZ. In addition, to further minimize risk to the nearby residences during construction, mitigation measure HAZ-1 would be implemented. Therefore, impacts associated with the exposure of people or structures to significant risk of loss, injury, or death would be less than significant with the incorporation of mitigation measure HAZ-1.

HAZ-1 Fire Safety Plan. To minimize the risk of losses resulting from wildfire, the following measures shall be implemented during project construction for the project:

- Construction within areas of dense foliage during dry conditions will be avoided, when feasible.
- In cases where avoidance is not feasible, brush fire prevention and management practices will be incorporated. Specifics of the brush management program will be incorporated into project construction documents.

10. Hydrology and Water Quality

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	■	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	■	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☐	☐
i. result in substantial erosion or siltation on- or off-site;	☐	☐	■	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	■	☐
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	■	☐
iv. impede or redirect flood flows?	☐	☐	☐	■
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	■
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	■	☐

a. **Less-Than-Significant Impact**. Potential water quality impacts associated with the proposed project would be limited to short-term construction-related erosion and sedimentation. Based on the nature of the proposed project (i.e., installation of a water tank), no potential long-term impacts to water quality would result. As required under the NPDES, administered by the RWQCB, a SWPPP would be created for the proposed project. The SWPPP would address erosion control measures that would be implemented to avoid erosion impacts to exposed soil associated with construction activities. The SWPPP would include a program of BMPs to provide erosion and sediment control and reduce potential impacts to water quality that may result from construction activities. BMPs would be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. Standard BMPs may include the following types of measures:

- Temporary erosion control measures such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other groundcover would be employed for disturbed areas.

- Storm drain inlets on the site and in downstream off-site areas would be protected from sediment with the use of BMPs acceptable to the District, local jurisdictions, and the California RWQCB, Santa Ana Region.

- Dirt and debris would be swept from paved streets in the construction zone on a regular basis, particularly before predicted rainfall events.

- No disturbed surfaces would be left without erosion control measures in place between October 15 and April 15. The District would file a Notice of Intent with the Regional Board and require the preparation of a SWPPP prior to commencement of construction. The District would routinely inspect the construction site to verify that the BMPs specified in the SWPPP are properly installed and maintained. The District would immediately notify the contractor if there were a non-compliance issue and require immediate compliance.

Additionally, the District would obtain coverage under the NPDES Construction General Permit. Construction activities would be required to comply with the conditions of this permit, including, but not limited to, preparation of a SWPPP, implementation of BMPs, and monitoring, to ensure impacts to water quality are minimized. Potential water quality impacts would be avoided or reduced below a level of significance through conformance with NPDES permit conditions.

While the depth to groundwater around the site is generally deep and dewatering would not be likely, if dewatering is necessary then controls on construction site dewatering would be implemented. If possible, water generated as a result of construction site dewatering would be discharged on site so that there would be no discharge to downstream watercourses. If discharge to surface water were unavoidable, the District would require the contractor to comply with the provision of the NPDES General Dewatering Permit. The provisions of this permit are sufficiently protective of water quality to ensure that impacts to surface water would remain below significant thresholds. During dewatering activities, permit conditions would be followed. The District would routinely inspect the construction site to verify that permit measures are properly implemented. The District would notify the contractor of notable non-compliance and require immediate compliance.

b. **Less-Than-Significant Impact**. Groundwater was not encountered during previous investigations or during previous grading of the site. Groundwater is anticipated to be present at significant depth below the site (AK 2020). Construction and operation of the proposed tank would not require or affect the use of groundwater or substantially hinder groundwater recharge. The proposed detention basin would collect surface water allowing for additional groundwater recharge as compared to existing conditions. Therefore, the project would not substantially decrease groundwater supplies or interfere with groundwater recharge such that the project would impede sustainable groundwater management. Impacts would be less than significant.

c.i. **Less-Than-Significant Impact**. The project would increase the amount of impervious surfaces on the project site due to the footprint of the proposed tank and related access road surrounding the tank. The project would replace and reconfigure the existing drainage system on site. The proposed drainage infrastructure would include the construction of swales and gutters, which would collect the stormwater flows from the project site and divert them down the project slope (northwest of the proposed tank) and into the on-site detention basin. The detention basin would be lined with Water Quality Basin Hydroseed Mix to provide filtration and stabilize the soils. The detention basin would accommodate flows from the site and tank overflows as needed. Post-project runoff on the site would be equal or less than existing conditions. Therefore, the detention basin is anticipated to adequately accommodate project site flows. Rip-rap energy dissipaters are proposed at the detention basin entrance and downstream of the spillway, which would slow the flow of water thereby reducing the potential for soil erosion. Additionally, during construction, the proposed project would utilize erosion control devices, such as silt fences, gravel bags, and fiber rolls to prevent construction-related erosion impacts. Due to the control of storm flows and implementation of BMPs as required by the NPDES permit, impacts associated with erosion and siltation as a result of a change in drainage patterns would be less than significant.

c.ii. **Less-Than-Significant Impact**. As discussed in Item 10.c.i, the proposed project includes storm drainage improvements to convey and retain storm flows as needed. The proposed detention basin would be sized to adequately store the volume of on-site stormwater flows. As stated above, post-project runoff on the site would be equal or less than existing conditions. Therefore, the detention basin would be able to accommodate these flows. Impacts associated with surface runoff and flooding from a change in drainage patterns would be less than significant.

c.iii. **Less-Than-Significant Impact**. As discussed in Item 10.c.i, runoff water associated with the developed portion of the project site would be collected at an on-site detention basin. Positive drainage devices, such as graded trapezoidal swales, and/or area drains, shall be provided around the new construction to collect and direct water to the water quality detention basin on site. No rain or excess water would be allowed to pond against building walls or foundations. As discussed in Item 10.a, implementation of BMPs and compliance with NPDES requirements would reduce short-term pollutant generation and ensure that the proposed project would not result in additional sources of polluted runoff. Impacts would be less than significant.

c.iv. **No Impact.** The project site is not located within an area prone to flooding (see Figures S-9 and S-10 in County 2015b) and the project would therefore not impede or redirect flood flows. The project site is over a mile away from possible flood zones. No impact would occur.

d. **No Impact**. The project site is not located within a 100-year flood hazard area and is not within an inundation area associated with Railroad Canyon Reservoir (located approximately two miles to the west) or Lake Elsinore (located approximately six and a half miles to the southwest). Due to the elevation of the project site and substantial distance from a significant body of water, the project would not be at risk from hazards related to floods and seiches. Given the project's distance from the Pacific coast (approximately 30 miles), the project would also not be at risk from inundation by tsunami. Therefore, no impacts related to release of pollutants in a flood hazard, seiche, or tsunami zone would occur.

e. **Less-Than-Significant Impact.** The project site is located within the jurisdiction of the Santa Ana RWQCB and the project would be implemented in accordance with the Water Quality Control Plan for the Santa Ana River Basin (refer to Items 10.a through 10.c for more discussion) (RWQCB 2016). The project would comply with storm water quality standards during construction and operation, and appropriate BMPs would be implemented to address and avoid water quality impacts and remain consistent with the Water Quality Control Plan. Impacts would be less than significant.

11. Land Use and Planning

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	☐	☐	■	☐
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	■	☐

The following discussion is based on the Land Use Element of the City of Menifee's General plan (City 2013).

a. **Less-Than-Significant Impact**. The proposed project is located in an area that contains existing and proposed residences. No new roads or other infrastructure is proposed as part of the project that would divide or create a barrier within an existing community. Construction of the project may result in short-term increases in vehicle trips and/or road detours during the construction period; however, once construction is completed, the project would not interfere with community access. Therefore, the proposed project would not physically divide an established community, and impacts would be less than significant.

b. **Less-Than-Significant Impact**. The proposed project would construct a new water tank and related facilities in the City of Menifee. The project would not affect land use designations or zoning, nor would it prohibit future development in association with land use guidance and policy documents. As such, the project would not conflict with applicable land use plans, policies, or regulations of an agency having jurisdiction over the project, nor would it conflict with zoning or general plan land use designations.

As discussed in Item 4.f, the District is not a signatory to the MSHCP, and is pursuing MSHCP coverage as a PSE. As a PSE, the District would be required to demonstrate MSHCP compliance. Impacts would be less than significant.

12. Mineral Resources

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	■
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	■

a. **<u>No Impact</u>**. The project site is located within Aggregate Mineral Resource Classification Zone Category 3 (MRZ-3; Miller and Busch 2008) and Urban Area. MRZ-3 indicates that the significance of mineral deposits cannot be evaluated from available data. The project site does not contain known significant mineral resources and is not currently used (or planned for use) or designated by the City of Menifee General Plan as a mineral resource recovery site; therefore, no impact to mineral resources would occur as a result of project implementation.

b. **<u>No Impact</u>**. Refer to Item 12.a, above.

13. Noise

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	■	☐	☐
b. Generation of excessive ground-borne vibration or ground-borne noise levels?	☐	■	☐	☐

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
c. For a project located within the vicinity of a private airstrip or an airport land use plan, or where such a plan has not been adopted within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	□	□	□	■

The following discussion is based on the Construction Noise Analysis Letter Report Prepared by HELIX (HELIX 2022d; Appendix E). All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration.

Discussion

Existing Noise Setting

The project site is in a rural area with open space to the north, south, and east and rural residential uses to the west, resulting in a relatively quiet existing noise environment. The primary existing noise source in the vicinity is vehicular traffic along Goetz Road, located approximately 1,400 feet west of the site, and occasional vehicles passing by on South Canyon Drive, located immediately adjacent to the northwestern boundary of the site. Other sources of noise include occasional aircraft and typical rural residential sources such as barking dogs and mechanical equipment.

Two 10-minute ambient noise measurements were conducted at the Project site on February 1, 2022, one in the southeastern portion of the site by the existing water tank and one in the northwestern portion of the site by South Canyon Road. Noise levels were measured to be 41.0 dBA L_{EQ} at the southeastern location and 51.6 dBA L_{EQ} at the northwestern location. The primary difference between the two measured noise levels is that no vehicles passed by the site along South Canyon Road during the measurement at the southeastern location while 10 vehicles, including two medium trucks, passed by the site along South Canyon Road during the measurement at the northwestern location.

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise and generally include residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations are considered "vibration-sensitive." The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. NSLUs and vibration-sensitive land uses in the project vicinity include a single-family residence immediately south of the project site and additional single-family residences further to the west.

a. **Less Than Significant With Mitigation Incorporated**.

On-site Construction Noise

Construction of the proposed project would require the use of heavy equipment for demolition, site preparation, grading (including ripping bedrock), trenching and pipeline installation, installation of the tank, and paving. Construction activities also would involve the use of smaller power tools, generators, and other sources of noise for construction of the proposed tank. Each construction activity would create elevated short-term construction noise impacts.

Construction would generate elevated noise levels that would be audible at nearby residential uses. Excess materials generated during demolition, site preparation, and grading would be transported to a location within the project site; therefore, on-road haul truck trips are not anticipated related to export of materials.

Each phase of construction would include a combination of equipment that would have the potential to operate simultaneously at the site. The pieces of equipment would be mobile across the project site over the course of a workday. Accordingly, for analysis purposes, an average distance from the approximate center of the work area for each construction phase to the residential property line to the southwest, which is the closest NSLU to the project site, is used to calculate expected noise levels. Demolition, site preparation, grading, and underground utility installation would occur throughout the site; therefore, a distance of 130 feet to the southwestern residential property line is used. Tank construction, paving, and architectural coating would occur at the proposed tank location; therefore, a distance of 100 feet to the southwestern residential property line is used. The equipment combinations by construction phase, average distances to the receptor property, and calculated noise levels are further described in the Noise Analysis (Appendix E). The highest noise levels anticipated during construction would reach 73.3 dBA; these noise levels are anticipated to occur during demolition, site preparation, grading, and tank construction.

Per the City's Development Code (Section 9.210.060, Noise Control Regulations), construction projects located within 0.25 mile from an inhabited dwelling are permitted Monday through Saturday from 6:30 a.m. to 7:00 p.m. Project construction would occur within these hours and would therefore be in compliance with the City's Development Code as related to construction noise; however, project construction would generate noise that would represent a substantial increase over ambient levels, which is considered a 10-dBA increase (a 10-dBA increase is generally perceived as a doubling of loudness). Therefore, construction noise impacts are considered potentially significant and mitigation measure NOI-1 would be required to reduce impacts to a less-than-significant level.

NOI-1 **Construction Noise Management Plan**. Noise from project construction activities shall comply with the limits and hours specified in the City of Menifee Development Code. Construction shall not occur outside the hours of 6:30 a.m. and 7:00 p.m. Monday through Saturday. No construction shall occur on Sunday or nationally recognized holidays unless approval is obtained from the City Building Official or City Engineer. Though the project would be exempt from specific noise thresholds contained within Section 9.210.060 of the City of Menifee Development Code, the 65-dBA L_{EQ} exterior noise standard for stationary sources is used herein as a construction noise performance standard, with an adjusted time-averaged noise level duration appropriate for construction. Construction noise shall not exceed 65 dBA L_{EQ} (8-hour) at nearby residential land uses.

Additionally, appropriate measures shall be implemented to reduce construction noise, including, but not limited to, the following BMPs:

- Construction equipment shall be properly outfitted and maintained with manufacturer-recommended noise-reduction devices.
- Diesel equipment shall be operated with closed engine doors and equipped with factory-recommended mufflers.
- Mobile or fixed "package" equipment (e.g., arc-welders and air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible.
- Unnecessary idling of internal combustion engines (e.g., in excess of 5 minutes) shall be prohibited.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.
- No project-related public address or music system shall be audible at adjacent sensitive receptors.
- Trucks or equipment equipped with back-up alarm moving within 300 feet of a Noise Sensitive Land Use (NSLU) should have the normal back-up alarm disengaged and safety provided by lights and flagman or broad-spectrum noise backup alarm (as appropriate for conditions) used in compliance with the Occupational Safety and Health Administration safety guidelines.
- Temporary sound barriers or sound blankets shall be installed between construction operations and adjacent residences. The Project Contractor shall construct a temporary noise barrier of a height breaking the line of sight between the equipment and nearby receptors and meeting the specifications listed below (or of a Sound Transmission Class 19 rating or better) to attenuate noise.
- If a temporary barrier is used, barriers shall be solid and constructed of wood, plastic, fiberglass, steel, masonry, or a combination of those materials, with no cracks or gaps through or below the wall. Seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove or close butted seams and must be at least 3/4-inch thick or have a surface density of at least 3.5 pounds per square-foot. Sheet metal of 18-gauge (minimum) may be used if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from

vibration or wind. Noise blankets, hoods, or covers also may be used, provided they are appropriately implemented to provide the required sound attenuation.

- Residents within 200 feet of the project's disturbance area shall be notified in writing within one week of construction activity. The notification shall describe the activities anticipated, provide dates and hours, and provide contact information with a description of a complaint and response procedure.

- The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process for the affected resident shall be established prior to construction commencement to allow for resolution of noise problems that cannot be immediately solved by the site supervisor.

There is potential that blasting may be required for underlying bedrock at the project site. At the current stage of planning, exact blasting requirements are unknown, including the associated quantities of blasts, blast fuel, holes per blast and area per blast. However, if blasting is to occur, it could cause excessive noise and impacts are conservatively assessed as potentially significant. Mitigation measure NOI-2 would be required to reduce impacts to a less-than-significant level.

NOI-2 **Blasting Management Plan**. Should blasting be required on the project site, the project applicant shall prepare a Blasting Management Plan that minimizes potential blasting effects to adjacent residences. All blast planning must be done by a City of Menifee-approved blasting contractor and submitted to the City with the appropriate blasting permits, and all other applicable local, state, and federal permits, licenses, and bonding. The blasting contractor or owner must conduct all notifications, inspections, monitoring, and major or minor blasting requirements planning with seismograph reports, as necessary.

Construction Traffic Noise

During grading, the project is anticipated to require the import of 22,636 cubic yards of soil resulting in an estimated total of 2,830 haul truck trips along South Canyon Drive over the course of the grading phase, which is anticipated to last 41 days. This equates to 69 truck trips per day and 6 truck trips per hour over the course of a 12-hour workday. Single-family residential properties are located along South Canyon Drive, with property lines approximately 30 feet from the roadway centerline. These residential properties would have the potential to be exposed to increased noise levels from the haul trucks.

The Federal Highway Administration's (2004) Traffic Noise Model was used to calculate noise levels from the haul trucks at the residential properties. Six trucks per hour traveling at a speed of 25 miles per hour would generate a noise level of 55.6 dBA L_{EQ} at 30 feet. This would represent a 4-dBA increase over the ambient noise level of 51.6 dBA L_{EQ} measured along South Canyon Drive, which is less than the 5-dBA readily noticeable increase in noise levels. Therefore, while the movement of haul trucks used for import of material during the project's grading phase may be audible over the short term, it would not result in a substantial increase over ambient noise levels. In addition, the calculated noise level of 55.6 dBA L_{EQ} is below the 65-dBA L_{EQ} exterior noise standard for stationary sources set forth in the City of Menifee Development Code. Impacts associated with construction traffic would be less than significant.

Operational Noise

Section 9.210.060 (Noise Control Regulations) of the City of Menifee Development Code (City 2021) establishes standards for regulating noise for the City. The ordinance does not, however, establish thresholds of significance for the purpose of CEQA analysis. Noise review and planning for the County provides guidelines for the determination of community noise impacts due to stationary (i.e., non-transportation) noise sources. The stationary noise exposure standard for the property line of an occupied residential property is 45 dBA between 10:00 p.m. and 7:00 a.m. and 65 dBA between 7:00 a.m. and 10:00 p.m. The standard for noise control is based on 10-minute noise equivalent level (L_{EQ}) measurements.

Operational noise associated with the project would include vehicle trips for periodic maintenance and security checks as well as maintenance activities at the project site. Project-related trips would result in a nominal increase from existing trips to the site; therefore, trips associated with vehicles for periodic maintenance and security checks would not result in increases in traffic noise levels in the area. The level of noise generated by maintenance activities is not expected to be substantially perceptible to surrounding uses. The operation of the project is not expected to expose persons to or generate noise levels in excess of standards for residential uses established in Section 9.210.060 (Noise Control Regulations) of the City of Menifee Development Code, and therefore, impacts associated with operational noise would be less than significant.

b. **Less Than Significant With Mitigation Incorporated**. Ground-borne vibration is a concern for projects that require heavy construction activity such as blasting, pile-driving, and operating heavy earth-moving equipment. Ground-borne vibration can result in a range of impacts, from minor annoyances to people to major shaking that damages buildings. Typically, ground-borne vibration generated by man-made sources attenuates rapidly with distance from the source of vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly and sick), and vibration-sensitive equipment.

The background vibration velocity level in residential areas is usually 50 vibration decibels (VdB) or lower; this is well below the level perceptible by humans, which is approximately 65 VdB. Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

The main source of vibration anticipated during project construction would be a vibratory roller, which would primarily be used to achieve soil compaction for the tank foundation and new pavement around the tank. Due to its mobile nature of operations, the use of a vibratory roller during construction would occur at an average distance, over the course of a workday, of 170 feet from the nearest off-site residential dwelling to the southwest. A vibratory roller creates approximately 0.21 inch per second (in/sec) of peak particle velocity (PPV) at a distance of 25 feet. At a distance of 170 feet, a vibratory roller would create a PPV of 0.025 in/sec. This would be below the 0.035-in/sec PPV distinctly perceptible human annoyance potential criteria for steady state sources and below the 0.5-in/sec PPV damage potential criteria for residential structures, as provided in Caltrans' Transportation and Construction Vibration Guidance Manual (Caltrans 2020). In addition, the use of a vibratory roller would be temporary.

Loaded haul trucks carrying import soil during the project's grading phase would have the potential to generate vibration at residences along South Canyon Drive. Residential dwellings are located as close as approximately 60 feet from the roadway centerline. A large haul truck generates vibration levels of 0.076 in/sec PPV at 25 feet (Caltrans 2020). At a distance of 60 feet, a haul truck would generate a PPV of 0.029 in/sec. This would be below the 0.035-in/sec PPV barely perceptible human annoyance potential criteria for transient sources. The transient source criteria are the applicable criteria here as vibration exposure at a given residence would be limited to the short duration (approximately five seconds) during which a truck is passing by. A PPV of 0.029 in/sec would also be below the 0.5-in/sec PPV damage potential criteria for residential structures.

As discussed above in Item 13.1, there is potential that blasting may be required for underlying bedrock at the project site, which, in addition to noise, could generate excessive vibration levels. As such, impacts are considered potentially significant and mitigation measure NOI-2 would be implemented to reduce impacts to a less-than-significant level, should blasting be required.

c. **No Impact**. As discussed in Item 9.e, the project site is located approximately five miles south of Perris Valley Airport-L65. The project site is not located within an airport land use plan or within two miles of a public or private airstrip. Additionally, the proposed project does not propose habitable structures that would result in people being exposed to noise from an airport. No impact would occur.

14. Population and Housing

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	■
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	■

Discussion

a. **No Impact**. Implementation of the proposed project would not directly induce population growth due to the fact that no new housing or businesses are proposed as a result of this project. The proposed project would upgrade the operations and capacity of the existing water system to accommodate an identified deficit in potable water storage, and it would not extend service outside of the District's service area. The proposed project would help accommodate existing and planned growth; therefore, it would not induce unplanned growth. For these reasons, no impact associated with population growth would occur.

b. **<u>No Impact</u>**. The proposed project involves the construction and operation of a water tank and related facilities, and would not require the removal of existing people or housing or the associated construction of replacement housing. No impact would occur.

15. Public Services

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	■	☐
Police protection?	☐	☐	■	☐
Schools?	☐	☐	☐	■
Parks?	☐	☐	☐	■
Other public facilities?	☐	☐	☐	■

Discussion

a. **Fire Protection – <u>Less-Than-Significant Impact</u>**. The construction and operation of the proposed project would not result in increases in the need for fire protection services. During construction, fire protection may be required, but these would be short-term demands and would not require permanent increases in the level of public service offered or affect response times associated with fire protection services. Because of the short-term nature of potential fire protection needs limited to the construction period, the proposed project would result in less-than-significant impacts associated with fire protection services.

Police Protection – <u>Less-Than-Significant Impact</u>. Impacts to police protection would be similar to those described above for fire protection services. During construction, there may be a need for increased police protection at the site associated with potential theft or vandalism at the project site. However, the long-term operation of the project would not result in increases in the need for police protection services. Impacts would be less than significant.

Schools – <u>No Impact</u>. The proposed project would place no demand on school services because it would not involve the construction of facilities that require such services (i.e., residences) and would not result in increases in population to the project area. No impact would occur.

Parks – <u>No Impact</u>. The proposed project would not result in increases in population in the project area, and thus, would not result in increased usage or demand on parks. No impact would occur.

Other Public Facilities – <u>No Impact</u>. The project does not propose new housing, nor would it induce population growth such that there would be an increase in demand for new or expanded public services. Accordingly, the proposed project would not result in impacts to other public facilities.

16. Recreation

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	■
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	■

Discussion

a. **<u>No Impact</u>**. See Item 15.a. The proposed project would not result in population increases, and thus, would not result in an increased usage of parks or other recreational facilities. No impact would occur.

b. **<u>No Impact</u>**. The proposed project would not include recreational facilities or require the construction or expansion of recreational facilities. No impact would occur.

17. Transportation/Traffic

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	■	☐
b. Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	☐	☐	☐	■
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	■
d. Result in inadequate emergency access?	☐	☐	■	☐

Discussion

a. **<u>Less-Than-Significant Impact</u>**. Regional access to the project site is provided by I-215 and I-15. Local access would be provided by Goetz Road and Canyon Drive. Goetz Road is a regional north-south route and Canyon Drive is a two-lane paved neighborhood loop that provides direct access to the project site. Construction and operation of the proposed project would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.

   The project would result in a short-term increase in traffic during construction but does not conflict with land use designations. Project-related construction traffic would include trucks for the import and export of materials (e.g., cut/fill earth material, demolition material, construction materials) and vehicles for construction employee travel to and from the work site. As discussed in Item 13, truck trips are not expected to exceed 69 trips per day, or 6 trips per hour over the course of a 12-hour workday. Worker trips are expected to be approximately 20 per day, which would be concentrated during short periods for morning and afternoon commutes. This number of daily vehicle trips would not degrade the effectiveness of the circulation system. Furthermore, construction trips would be temporary.

   The project is not expected to generate a long-term increase in traffic. Operational traffic would consist of occasional maintenance and security checks, which would have occurred without the proposed project due to the existing infrastructure on site.

   No roadway improvements or land use changes with the potential to affect alternative transportation facilities are proposed as part of this project. There are no designated bus stops, bike lanes, or alternative transportation programs in place within the project site vicinity or other roads that would be temporarily impacted by the proposed project. Thus, implementation of the proposed project would not conflict with adopted policies, plans, or programs supporting alternative transportation. Impacts would be less than significant.

b. **<u>No Impact</u>**. CEQA Guidelines Section 15064.3 subdivision (b) sets forth specific criteria for determining the significance of transportation impacts. Subdivision (b)(1) pertains to land use projects and describes factors that may indicate whether the amount of a land use project's vehicle miles traveled may be significant or not. Because project-related traffic would be limited predominantly to a relatively small number of trips during the construction period and a negligible number of trips associated with maintenance and security checks during operations, a vehicle miles traveled analysis is not required. Therefore, the project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, and no impact would occur.

c. **<u>No Impact</u>**. The proposed project would include construction and operation of a water tank. The project site is accessed through an unnamed access road off of South Canyon Drive and the geometry of the intersection would not be altered as a result of this project. The proposed project does not propose site modifications that would result in hazards due to design features such as driveways, intersection improvements, etc., that would affect traffic safety, nor would it cause incompatible uses (such as tractors) on local roads. No associated impact would occur.

d. **<u>Less-Than-Significant Impact</u>**. Implementation of the proposed project would not result in inadequate emergency access as traffic impacts during construction would be minimal and temporary. The on-site access road could be used for emergency access and adequate turnaround areas exist on site for emergency vehicle movements. A small portion of South Canyon Drive may be temporarily closed during the proposed pipeline replacement within the right-of-way; however, traffic detours or diversions would continue to allow ingress/egress from the project area. Therefore, impacts to emergency access would be less than significant.

18. Tribal Cultural Resources

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resources, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe that is:				
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources, as defined in Public Resources Code Section 5020.1(k)?	□	□	□	■
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	□	■	□	□

Discussion

Potentially relevant to prehistoric/Native American archaeological sites is the category termed TCPs in discussions of cultural resource management performed under federal auspices. “Traditional” in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. Cultural resources can include TCPs, such as gathering areas, landmarks, and ethnographic locations in addition to archaeological districts. Generally, a TCP may consist of a single site, or group of associated archaeological sites (district or traditional cultural landscape), or an area of cultural/ethnographic importance.

AB 52, effective July 1, 2015, introduced the Tribal Cultural Resource (TCR) as a class of cultural resource and additional considerations relating to Native American consultation into CEQA. As a general concept, a TCR is similar to the federally defined TCP; however, it incorporates consideration of local and state significance and required mitigation under CEQA. A TCR may be considered significant if included in a local or state register of historical resources; or determined by the lead agency to be significant pursuant to criteria set forth in Public Resources Code §5024.1; or is a geographically defined cultural landscape that meets one or more of these criteria; or is a historical resource described in Public

Resources Code §21084.1, a unique archaeological resources described in Public Resources Code §21083.2; or is a non-unique archaeological resource if it conforms with the above criteria.

a. **No Impact**. As discussed in Item 5.a, no properties currently listed on the NRHP or CRHR, historical resources, or historic landmarks were recorded within or immediately adjacent to the project area. No potentially significant TCRs of historic age were observed within or immediately adjacent to the project site during the historic photograph investigation conducted for the project. Therefore, no substantial adverse changes to the significance of TCRs within the project vicinity are anticipated and no impact would occur.

b. **Less-Than-Significant Impact with Mitigation Incorporated**. See discussion in Item 5. The response from the regional tribes detailed the requests of the tribal land potentially affected by the project. Implementation of mitigation measures CUL-1 though CUL-5 would ensure that potential impacts related to disturbance of cultural resources would be reduced to less than significant.

19. Utilities and Service Systems

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	■
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☐	■
c. Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	■
d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	■	☐
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	■

Discussion

a. **No Impact**. The proposed project would provide the District with improved service capabilities and reliability. Utility power currently enters the north end of the site near the existing access gate. Due to the low power requirements for the new tank, power would be provided from the existing panel installed within the existing Inlet/Outlet Enclosure for Quail Valley Tank II. The power requirements for the new site would consist of exterior lights, new GFI receptacles and the tank Mixer. Power would be provided with existing utilities and facilities; the project would not require or result in the relocation or construction of new utility facilities or the expansion of existing facilities. No associated impact would occur.

b. **No Impact**. The proposed project would involve the construction and operation of a water storage tank, a detention basin, and related facilities which would not require new or expanded entitlements for water service. No impact would occur.

c. **No Impact**. The proposed project would not require or result in the construction of new wastewater treatment facilities or the expansion of existing wastewater treatment facilities. No impact would occur.

d. **Less-Than-Significant Impact**. Construction and operation of the proposed tank and related facilities would generate only minimal solid waste and would not affect landfill capacity. During construction of the project, construction debris (e.g., demolished concrete) would be generated. Project construction is not anticipated to generate substantial volumes of solid waste. Solid waste debris would be disposed of at a permitted landfill. Moreover, AB 939, also known as the Integrated Waste Management Act, and AB 341 mandate the reduction of solid waste disposal in landfills by requiring a minimum of 50 percent diversion rate. Accordingly, at least half of the potential construction waste would be diverted from a landfill. The remaining quantity is reasonably anticipated to be within the permitted capacity of the permitted landfills serving the project area. Operations of the project would generate negligible solid waste, if any. Impacts would be less than significant.

e. **No Impact**. See Section 19.d. The proposed project would comply with applicable, federal, State, and local management and reduction statutes and regulations related to solid waste. No impact would occur.

20. Wildfire

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	■	☐
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire?	☐	☐	■	☐
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	■	☐
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	■	☐

Discussion

a. **<u>Less-Than-Significant Impact</u>**. Refer to Item 9.f. Potential impacts related to emergency response would be less than significant.

b. **<u>Less-Than-Significant Impact</u>**. Aside from temporary construction and maintenance workers, there would be no occupants on site. Therefore, the project would not expose occupants to pollutants from a wildfire or an uncontrolled wildfire and impacts would be less than significant.

c. **<u>Less-Than-Significant Impact</u>**. Infrastructure that would be required as part of the proposed project and that may exacerbate fire risk includes a paved access road and electrical service to support tank operations. While the paved access road itself would not exacerbate fire risk and may actually serve as a fire break in the instance of a wildfire, its construction would require the use of off-road equipment in an area that is designated as a VHFHSZ. The primary concern with the use of construction equipment in a VHFHSZ is that the equipment's internal combustion engine has the potential to generate sparks and heat near flammable brush material. Equipment used for the proposed project, however, would be equipped with spark arrestors, per industry standards. In addition, the project would reduce the amount of flammable material on site through vegetation removal.

   Similarly, improperly functioning electrical wires have the capability of producing sparks. The District has established protocol to ensure the proper installation and maintenance of electrical equipment.

Specifically, Section 16010 – General Electrical Requirements of the District's Standard Detailed Provisions requires equipment and materials to conform to numerous standards, one of which is the National Fire Protection Association's National Electric Code. The National Electric Code sets forth standards for safe electrical design, installation, and inspection to protect people and property from electrical hazards, including those associated with wildfire hazards.

The District has also established general construction protocol as part of their contract documents to minimize fire risk in Section 02201 – Construction Methods and Earthwork of the Standard Detailed Provisions. Protocol includes verifying standard on-site fire prevention measures are constantly enforced, maintaining appropriate fire extinguishers and/or temporary fire hoses, and storing flammable materials away from work areas. Through conformance with District and standard industry measures, impacts would be less than significant.

d. **Less-Than-Significant Impact**. The project site is not located in an area prone to flooding (County 2015b) and the proposed structures would therefore not be exposed to risk from downstream flooding. Due to the sloped nature of the project site and surrounding areas, the proposed structures have the potential to be exposed to landslides that may occur from post-fire slope instability; however, as discussed under Item 7.a.iv, the proposed tank and associated structures would be designed and constructed pursuant to applicable standards and guidelines to minimize risk associated with landslides. Therefore, impacts would be less than significant.

21. Mandatory Findings of Significance

Issues	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	□	■	□	□
b. Does the project have impacts that are individually limited, but cumulatively considerable ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	□	□	■	□
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	□	□	■	□

Discussion

a. **Less Than Significant with Mitigation Incorporated**. As described under Item 4, Biological Resources, and Item 5, Cultural Resources, the proposed project has the potential to impact wildlife and California prehistory; however, impacts would be reduced to less than significant with the incorporation of mitigation measures. Per the instructions for evaluating environmental impacts in this Initial Study, the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory were considered in the response to each question in Items 4 and 5 of this form. As a result of this evaluation, the project was determined to have potential significant direct effects related to biological resources (loss of sensitive habitat and adverse impacts on sensitive species), cultural resources (archaeological resources and paleontological resource), and tribal cultural resources (significance of tribal cultural resources). Mitigation measures BIO-1 through BIO-6, and CUL-1 through CUL-7 would reduce potential impacts to less-than-significant levels for these issue areas.

b. **Less-Than-Significant Impact**. Implementation of the proposed project would not result in impacts that are individually limited, but cumulatively considerable. The majority of project-related impacts would be localized, short-term impacts. Additionally, no other projects have been identified within the same general location and timeframe that would have cumulative effects when considered with the proposed project.

   The project is consistent with local and regional plans, including the AQMP. The project adheres to other land use plans and policies with jurisdiction in the project area. The project is not considered growth-inducing as defined by State CEQA Guidelines Section 15126.2(d). The project would not induce, either directly or indirectly, population and housing growth, and would increase traffic volume marginally in the project area. Therefore, cumulative impacts would be less than significant.

c. **Less-Than-Significant Impact**. With adherence to regulatory codes, ordinances, regulations, standards, and guidelines, in conjunction with the discussed mitigation measures, construction and operation of the proposed project would not present a substantial adverse effect on human beings either directly or indirectly. In addition, all resource topics associated with the project have been analyzed in accordance with State CEQA Guidelines and found to pose no impact, less than significant impact, or less than significant impact with mitigation. Further environmental analysis is not required. Impacts would be less than significant.

VI. Report Authors/Contributors

<u>Report Authors</u>

HELIX Environmental Planning, Inc.

Amy L. Mila de la Roca, Project Manager
Tim Belzman, Principal Planner and QA/QC Reviewer
Ellia Simmons, Environmental Planner
Hunter Stapp, Environmental Planner/Noise Analyst
Kristen Garcia, Environmental Planner/Air Quality Analyst

<u>Report Contributors</u>

Eastern Municipal Water District

Regulatory and Environmental Compliance
Al Javier, Director, Environmental and Regulatory Compliance
Joseph Broadhead, Principal Water Resources Specialist – CEQA

VII. References

Albus-Keefe & Associates (AK)

2020 Geotechnical Design Report for Proposed Construction of Second Tank (Quail Valley Tank III) at the Existing Quail Valley II Tank Site. April 28.

California Air Resources Board (CARB)

2005 Air Quality and Land Use Handbook: A Community Health Perspective. April. Available at: https://ww3.arb.ca.gov/ch/handbook.pdf.

California Building Code (CBC)

2019 The California Building Standards Code (Cal. Code Regs., Title 24). Available at: https://www.dgs.ca.gov/BSC/Codes.

California Department of Conservation (DOC), Division of Land Resources Protection

2018 Farmland Mapping and Monitoring Program, California Important Farmland Finder. Available at: https://maps.conservation.ca.gov/DLRP/CIFF/.

2016 Riverside County Williamson Act FY 2015/2016, Sheet 1 of 3 map. Available at: ftp://ftp.consrv.ca.gov/pub/dlrp/wa/Riverside_w_15_16_WA.pdf.

California Department of Forestry and Fire Protection (CAL FIRE)

2020 Fire Hazards Severity Zones Maps. Available at: https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Accessed January 3, 2022.

2009 Western Riverside County, Very High Fire Hazard Severity Zones in LRA map. Available at: http://frap.fire.ca.gov/webdata/maps/riverside_west/fhszl_map.60.pdf.

California Department of Toxic Substances Control (DTSC)

2017 EnviroStor Database. Available at: http://www.envirostor.dtsc.ca.gov/public/.

California Department of Transportation (Caltrans)

2020 Transportation and Construction Vibration Guidance Manual. Accessed January.

2017 Officially Designated Scenic Highways: Caltrans Landscape Architecture Program, website. Accessed March 19, 2017. Available at: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/.

2003 Construction Site Best Management Practices Manual. January. Available at: http://www.dot.ca.gov/hq/construc/stormwater/BMP_Field_Master_FullSize_Final-Jan03.pdf.

California Department of Water Resources (CDWR)

2019 California's Groundwater (Bulletin 118). Available at: https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118.

California State Water Resources Control Board (SWRCB)

2017 GeoTracker website. Accessed March 10, 2017. Available at: https://geotracker.waterboards.ca.gov/.

California Stormwater Quality Association

2015 Stormwater Best Management Practice Handbooks. January.

City of Menifee (City)

2021 City of Menifee Development Code. Accessed February 2022.

2020 City of Menifee Municipal Code. Accessed January 2022.

2015 City of Menifee Landscape Standards. March. Accessed January 2022.

2013 City of Menifee General Plan. December.

Criscione, J.J., Davis, T.E., & Ehlig, P.

1978 The Age of Sedimentation/Diagenesis for the Bedford Canyon Formation and the Santa Monica Formation in Southern California: a Rb/Sr evaluation.

Dudek and Associates

2003 Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Final MSHCP Volume I. Prepared for County of Riverside, Transportation and Land Management Agency.

Federal Highway Administration. 2004. Traffic Noise Model Version 2.5.

Greenbook Committee of Public Works Standards, Inc.

2015 Greenbook Standard Specifications for Public Works Construction. Available at: http://www.greenbookspecs.org/.

Hedges, Ken, and Christina Beresford

1986 *Santa Ysabel Ethnobotany*. San Diego Museum of Man Ethnic Technology Notes No. 20.

HELIX Environmental Planning, Inc. (HELIX)

2022a Air Quality and Greenhouse Gas Emissions Technical Report written for the Quail Valley Tank III Project. February.

2022b General Biological Resource Assessment Report written for the Quail Valley Tank III Project. February.

2022c Cultural Resources Survey written for the Quail Valley Tank III Project. February.

2022d Construction Noise Analysis Letter Report written for the Quail Valley Tank III Project. February.

International Conference of Building Officials

2012 International Building Code. Available at: http://publicecodes.cyberregs.com/icod/ibc/.

Miller, Russel V., and Lawrence L. Busch

2008 Updated Mineral Land Classification Map for Portland Cement Concrete-Grade Aggregate in the San Bernardino Production-Consumption Region, San Bernardino and Riverside Counties, California.

Murietta, City of (Murietta)

2004 City of Murrieta Municipal Code. 16.18.110 Mount Palomar Lighting Standards. Accessed January 2022. Available at: https://codelibrary.amlegal.com/codes/murrieta/latest/murrieta_ca/0-0-0-25204

Morton, Douglas M.

2003 Preliminary geologic Map of the Perris 7.5' Quadrangle, Riverside County, California. Accessed February 18, 2020. Available at: https://geo-nsdi.er.usgs.gov/metadata/open-file/03-270/metadata.faq.html.

Natural Resources Conservation Service (NRCS)

2020 Web Soil Survey. United States Department of Agriculture (USDA). Accessed January 23, 2022. Available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.Aspx.

Office of Environmental Health Hazard Assessment (OEHHA)

2015 Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February. Available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.

Regional Water Quality Control Board (RWQCB)

2016 Water Quality Control Plan for the Santa Ana River Basin. February. Available at: https://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/index.html.

Riverside, County of (County)

2019 County of Riverside Climate Action Plan Update. November. Available at: https://planning.rctlma.org/Portals/14/CAP/2019/2019_CAP_Update_Full.pdf.

2015a County of Riverside Climate Action Plan. December. Available at: http://planning.rctlma.org/Portals/0/genplan/general_plan_2016/climate_action_plan/CAP_120815.pdf?ver=2016-04-01-101221-240.

2015b County of Riverside General Plan. December 15. Available at: http://planning.rctlma.org/ZoningInformation/GeneralPlan.aspx.

2006 Burrowing owl survey instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area. Environmental Programs Department. Available at: https://www.rctlma.org/Portals/3/EPD/consultant/burrowing_owl_survey_instructions.pdf.

2003 County of Riverside General Plan, adopted October 7.

South Coast Air Quality Management District (SCAQMD)

2019 South Coast AQMD Air Quality Significance Thresholds. April. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pfdf?sfvrsn=2.

2017 Final 2016 Air Quality Management Plan. March. Available at: http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp.

1993 CEQA Air Quality Handbook.

Sparkman, Philip Stedman

1908 The Culture of the Luiseño Indians. University of California Publications in American Archaeology and Ethnology 8(4):187-234.

Silberling, N.J., Schoellhamer, J.E., Gray Jr, C.H., & Imlay, R.W.

1961 Upper Jurassic fossils from Bedford Canyon Formation, Southern California. *AAPG Bulletin*, *45*(10), 1746-1748.

U.S. Department of Transportation (USDOT)

2008 Roadway Construction Noise Model.

White, Raymond C.

1963 Luiseño Social Organization. University of California Publications in American Archaeology and Ethnology 48(2):91-194.

Youd, T. Leslie, and Izzat M. Idriss. (Youd et. al.)

2001 Liquefaction resistance of soils: summary report from the 1996 NCEER and 1998 NCEER/NSF workshops on evaluation of liquefaction resistance of soils. Journal of geotechnical and geoenvironmental engineering 127, no. 4: 297-313.

IS/MND Appendix A

Air Quality and Greenhouse Gas Emissions Technical Report

Quail Valley Regional Water Tank III Project

Air Quality and Greenhouse Gas Emissions Technical Report

February 2022 | 00678.00049.001

Prepared for:

Pulte Group
27401 Los Altos, Suite 400
Mission Viejo, CA 92691

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

This page intentionally left blank

TABLE OF CONTENTS

TABLE OF CONTENTS(cont.)

Section **Page**

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
APN	Assessor's Parcel Number
APS	alternative planning strategy
AQMP	Air Quality Management Plan
AR4	Fourth Assessment Report
AR5	Fifth Assessment Report
C_2F_6	hexafluoroethane
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards Code
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBSC	California Building Standards Commission
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CF_4	tetraflouromethane
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CY	cubic yard
District	Eastern Municipal Water District
DPM	diesel particulate matter
EO	Executive Order
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
I-	Interstate
IPCC	Intergovernmental Panel on Climate Change

ACRONYMS AND ABBREVIATIONS (cont.)

LCFS	Low Carbon Fuel Standard
LST	localized significance threshold
mg/m^3	milligrams per cubic meter
MMT	million metric tons
mpg	miles per gallon
mph	miles per hour
MPO	metropolitan planning organization
MT	metric tons
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NHTSA	National Highway Traffic Safety Administration
NO	nitrogen oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
Pb	lead
PFC	perfluorocarbon
PM	particulate matter
PM_{10}	particulate matter less than 10 microns
$PM_{2.5}$	particulate matter less than 2.5 microns
ppm	parts per million
ROG	reactive organic gas
RTP	Regional Transportation Plan
SAFE-1	SAFE Vehicles Rule Part I
SAFE-2	SAFE Vehicles Rule Part II
SAR	Second Assessment Report
SB	Senate Bill
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SF_6	hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide

ACRONYMS AND ABBREVIATIONS (cont.)

SO_X	sulfur oxides
SRA	source receptor area
TAC	toxic air contaminant
UNFCCC	United Nations Framework Convention on Climate Change
USEPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled
VOC	volatile organic compound
WRCOG	Western Riverside Council of Governments
WRI	World Resource Institute
ZEV	zero emissions vehicle

EXECUTIVE SUMMARY

This report presents an assessment of potential air quality and greenhouse gas (GHG) emissions impacts resulting from implementation of the Quail Valley Regional Water Tank III Project (Project) located in the City of Menifee. The Project consists of the construction of a 1.63-million-gallon potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure.

The Project would be consistent with the site's zoning and designation of PF (Public/Quasi Public Facilities). Therefore, the Project is accounted for in regional planning documents (e.g., general plans, Regional Transportation Plan/Sustainable Communities Strategy) used to develop control measures in the South Coast Air Quality Management District's (SCAQMD) Air Quality Management Plan (AQMP). The Project would not conflict with the AQMP.

The Project would result in emissions of criteria air pollutants during construction. However, Project emissions of criteria pollutants and precursors during construction would not exceed the SCAQMD emissions thresholds. Impacts related to cumulatively considerable net increases of criteria pollutants in the region would be less than significant. Due to the nature of the Project, operation would not result in long-term emissions.

Project-generated traffic would not result in a carbon monoxide hot spot. Construction and operation of the Project would not result in exposure of sensitive receptors to significant quantities of toxic air contaminants (TACs) or substantial localized criteria pollutant and precursor concentrations. Impacts related to exposure of sensitive receptors to substantial pollutant concentrations would be less than significant.

The Project would not generate other emissions (such as those leading to odors) that would affect a substantial number of people.

GHG emissions resulting from construction and operation of the Project would not exceed the County of Riverside's Climate Action Plan (CAP) screening threshold for individual projects. The Project would not conflict with the Southern California Association of Governments' (SCAG's) regional transportation plan (RTP)/Sustainable Communities Strategy (SCS), the County of Riverside's CAP, or other regional and stage GHG reduction plans. Impacts related to GHG emissions and conflicts with GHG reduction plans and policies would be less than significant.

This page intentionally left blank

1.0 INTRODUCTION

This report presents an assessment of potential air quality and greenhouse gas (GHG) emissions impacts resulting from construction and operation of the Eastern Municipal Water District's (District) proposed Quail Valley Regional Water Tank III Project (Project). This report summarizes the methodology and impact conclusions related to air quality and GHG emissions resulting from the Project.

1.1 PROJECT LOCATION

The Project site is located in the City of Menifee in southwestern Riverside County, California (Figure 1, *Regional Location*). The 5-acre facilities site is generally located within the community of Quail Valley, approximately 2.5 miles west of Interstate (I-) 215, northeast of I-15, and east of Goetz Road. The facilities site is on the east side of South Canyon Drive, within Assessor's Parcel Numbers (APNs) 341-050-006 and 341-050-007 (Figure 2, *Aerial Photograph*). The Project site is within the western Riverside County portion of the South Coast Air Basin (SCAB). Air quality in the Project area is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD).

1.2 PROJECT DESCRIPTION

The Project consists of the construction of a 1.63-million-gallon potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure (Figure 3, *Site Plan*). The tank will have a height of 40 feet and a diameter of 101 feet. The Project is anticipated to require 6,105 cubic yards of cut and 28,741 cubic yards of fill, for a total import of 22,636 cubic yards. Surrounding land uses include the Quail Valley Water Tank I approximately 250 feet to the north, the Quail Valley Hydropneumatic Water Pump Station to the northwest, a single-family residence to the south, the Quail Valley Water Tank II approximately 50 feet to the east, and South Canyon Drive and undeveloped land to the west. Access to the Project site is via South Canyon Drive and a private access road.

1.3 CONSTRUCTION ACTIVITIES AND PHASING

Project construction is assumed to occur over an approximately 1-year, 5-month period starting in March 2023 and completing in August 2024. Construction activities would include demolition (of existing concrete pipes, swales, and riprap at the site), site preparation, grading, installation of underground utilities, building construction, paving, and architectural coating (e.g., painting). It is assumed that the installation of underground utilities would occur during the grading phase. During grading, the Project would involve approximately 6,105 cubic yards (CY) of cut and 28,741 CY of fill, for a net fill of approximately 22,636 CY.

Project construction would be required to implement all applicable fugitive dust best available control measures specified in Table 1 of the SCAQMD Rule 403, *Fugitive Dust* (SCAQMD 2005), including, but not limited to: the use of an on-site water truck to wet down exposed areas at least twice daily, maintaining a 12 percent moisture content to unpaved roads, and limiting vehicle speeds to 15 miles per hour (mph).

2.0 REGULATORY SETTING

2.1 AIR QUALITY

The Project site is located within the SCAB. Air quality in the SCAB is regulated by the U.S. Environmental Protection Agency (USEPA) at the federal level, by the California Air Resources Board (CARB) at the state level, and by the SCAQMD at the regional level.

2.1.1 Air Pollutants of Concern

2.1.1.1 Criteria Pollutants

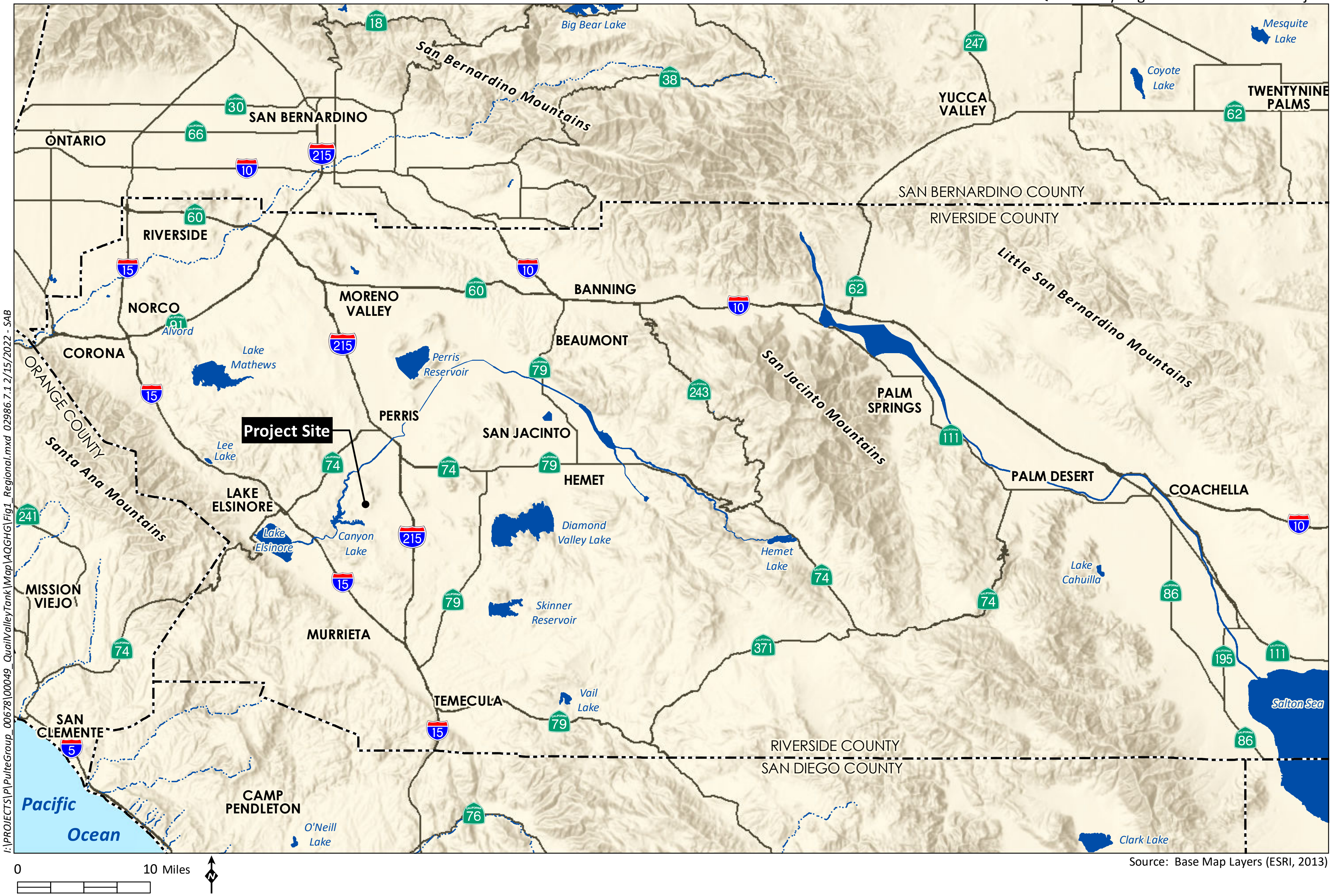
Criteria pollutants are defined by state and federal law as a risk to the health and welfare of the general public. In general, criteria air pollutants include the following compounds:

- Ozone (O_3)
- Carbon monoxide (CO)
- Nitrogen dioxide (NO_2)
- Particulate matter (PM), which is further subdivided:
  - Coarse PM, 10 microns or less in diameter (PM_{10})
  - Fine PM, 2.5 microns or less in diameter ($PM_{2.5}$)
- Sulfur dioxide (SO_2)
- Lead (Pb)

Criteria pollutants can be emitted directly from sources (primary pollutants; e.g., CO, SO_2, PM_{10}, $PM_{2.5}$, and lead), or they may be formed through chemical and photochemical reactions of precursor pollutants in the atmosphere (secondary pollutants; e.g., ozone, NO_2, PM_{10}, and $PM_{2.5}$). PM_{10} and $PM_{2.5}$ can be both primary and secondary pollutants. The principal precursor pollutants of concern are reactive organic gases ([ROGs] also known as volatile organic compounds [VOCs])[1] and nitrogen oxides (NO_X).

The descriptions of sources and general health effects for each of the criteria air pollutants are shown in Table 1, *Summary of Common Sources and Human Health Effects of Criteria Air Pollutants*, based on information provided by the California Air Pollution Control Officers Association ([CAPCOA] 2021a). Specific adverse health effects on individuals or population groups induced by criteria pollutant emissions are highly dependent on a multitude of interconnected variables such as cumulative concentrations, local meteorology and atmospheric conditions, and the number and characteristics of exposed individuals (e.g., age, gender). Criteria pollutant precursors (ROG and NO_X) affect air quality on a regional scale, typically after significant delay and distance from the pollutant source emissions. Health effects related to ozone and NO_2 are, therefore, the product of emissions generated by numerous sources throughout a region. Emissions of criteria pollutants from vehicles traveling to or from the Project site (mobile emissions) are distributed nonuniformly in location and time throughout the region,

[1] CARB defines and uses the term ROGs while the USEPA defines and uses the term VOCs. The compounds included in the lists of ROGs and VOCs and the methods of calculation are slightly different. However, for the purposes of estimating criteria pollutant precursor emissions, the two terms are often used interchangeably.



I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\AQGHG\Fig1_Regional.mxd 02986.7.1 2/15/2022 - SAB

Source: Base Map Layers (ESRI, 2013)

HELIX Environmental Planning

Regional Location

Figure 1

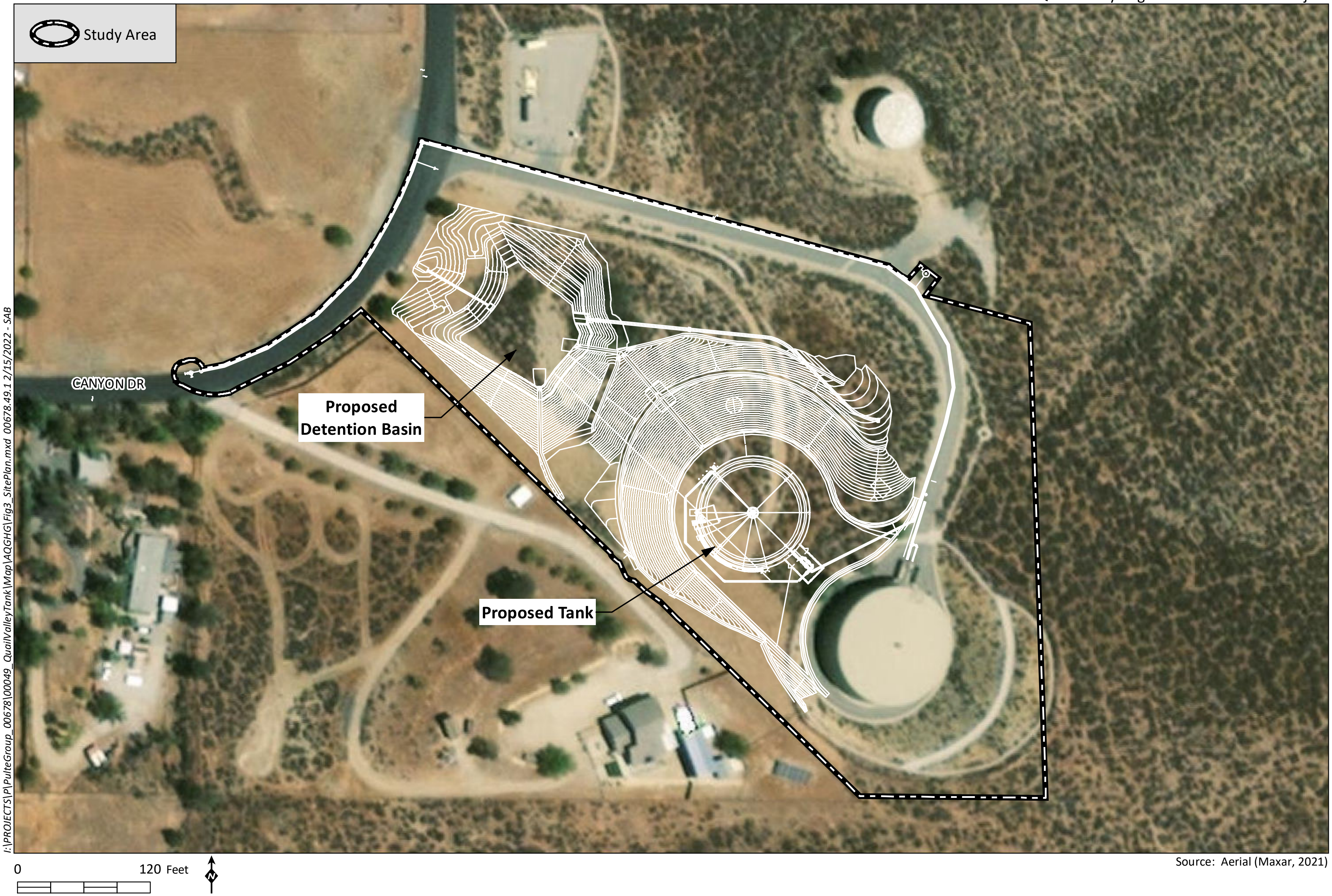
I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\AQGHG\Fig2_Aerial.mxd 00678.49.1 2/15/2022 - SAB

Source: Aerial (Maxar, 2021)

HELIX
Environmental Planning

Aerial Photograph

Figure 2



I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\AQGHG\Fig3_SitePlan.mxd 00678.49.1 2/15/2022 - SAB

Source: Aerial (Maxar, 2021)

HELIX
Environmental Planning

Site Plan

Figure 3

wherever the vehicles may travel. As such, specific health effects from these criteria pollutant emissions cannot be meaningfully correlated to the incremental contribution from the Project.

Table 1
SUMMARY OF COMMON SOURCES AND HUMAN HEALTH EFFECTS OF CRITERIA AIR POLLUTANTS

Pollutant	Major Man-Made Sources	Human Health Effects
Carbon Monoxide (CO)	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO_2)	A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include motor vehicles, electric utilities, and other sources that burn fuel.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Contributes to climate change and nutrient overloading, which deteriorates water quality. Causes brown discoloration of the atmosphere.
Ozone (O_3)	Formed by a chemical reaction between reactive organic gases (ROGs) and nitrogen oxides (NO_X) in the presence of sunlight. Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, gasoline storage and transport, solvents, paints, and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. Damages rubber, some textiles, and dyes.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Produced by power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles, and other sources.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Sulfur Dioxide (SO_2)	A colorless, nonflammable gas formed when fuel containing sulfur is burned, when gasoline is extracted from oil, or when metal is extracted from ore. Examples are petroleum refineries, cement manufacturing, metal processing facilities, locomotives, and ships.	Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid, which can damage marble, iron, and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.
Lead	Metallic element emitted from metal refineries, smelters, battery manufacturers, iron and steel producers, use of leaded fuels by racing and aircraft industries.	Anemia, high blood pressure, brain and kidney damage, neurological disorders, cancer, lowered IQ. Affects animals, plants, and aquatic ecosystems.

Source: CAPCOA 2021a

2.1.1.2 Toxic Air Contaminants

The Health and Safety Code (§39655, subd. (a).) defines a toxic air contaminant (TAC) as “an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health.” A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the Federal Clean Air Act (CAA) (42 United States Code

Section 7412[b]) is a TAC. Under State law, the California Environmental Protection Agency (CalEPA), acting through CARB, is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or that may pose a present or potential hazard to human health.

Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust is referred to as diesel particulate matter (DPM). Almost all DPM is 10 microns or less in diameter, and 90 percent of DPM is less than 2.5 microns in diameter (CARB 2021a). Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung. In 1998, CARB identified DPM as a TAC based on published evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects. DPM has a notable effect on California's population—it is estimated that about 70 percent of total known cancer risk related to air toxics in California is attributable to DPM (CARB 2021a).

2.1.2 Federal Air Quality Regulations

2.1.2.1 Federal Clean Air Act

Air quality is defined by ambient air concentrations of specific pollutants identified by the USEPA to be of concern with respect to health and welfare of the general public. The USEPA is responsible for enforcing the CAA of 1970 and its 1977 and 1990 Amendments. The CAA required the USEPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several criteria pollutants. Table 2, *Ambient Air Quality Standards*, shows the federal and state ambient air quality standards for these pollutants.

Table 2
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards Primary[1]	Federal Standards Secondary[2]
O_3	1 Hour	0.09 ppm (180 µg/m^3)	–	–
	8 Hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Same as Primary
PM_{10}	24 Hour	50 µg/m^3	150 µg/m^3	Same as Primary
	AAM	20 µg/m^3	–	Same as Primary
$PM_{2.5}$	24 Hour	–	35 µg/m^3	Same as Primary
	AAM	12 µg/m^3	12.0 µg/m^3	15.0 µg/m^3
CO	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
NO_2	1 Hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	–
	AAM	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
SO_2	1 Hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	–
	3 Hour	–	–	0.5 ppm (1,300 µg/m^3)
	24 Hour	0.04 ppm (105 µg/m^3)	–	–

Pollutant	Averaging Time	California Standards	Federal Standards Primary[1]	Federal Standards Secondary[2]
Lead	30-day Avg.	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3	Same as Primary
	Rolling 3-month Avg.	–	0.15 µg/m^3	Same as Primary
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per km – visibility ≥ 10 miles (0.07 per km – ≥30 miles for Lake Tahoe)	No Federal Standards	No Federal Standards
Sulfates	24 Hour	25 µg/m^3	No Federal Standards	No Federal Standards
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	No Federal Standards	No Federal Standards
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)	No Federal Standards	No Federal Standards

Source: CARB 2016

1 National Primary Standards: The levels of air quality necessary, within an adequate margin of safety, to protect the public health.

2 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

O_3 = ozone; ppm: parts per million; µg/m^3 = micrograms per cubic meter; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; AAM = Annual Arithmetic Mean; $PM_{2.5}$ = fine particulate matter; CO = carbon monoxide; mg/m^3 = milligrams per cubic meter; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; km = kilometer; – = No Standard

The USEPA has classified air basins (or portions thereof) as being in "attainment," "nonattainment," "maintenance," or "unclassified" for each criteria air pollutant, based on whether or not the NAAQS have been achieved. Upon attainment of a standard for which an area was previously designated nonattainment, the area will be classified as a maintenance area. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designation. The Project site is located within the Riverside County portion of the SCAB and, as such, is in an area designated as a nonattainment area for certain pollutants that are regulated under the CAA. Table 3, *South Coast Air Basin Attainment Status*, lists the federal and state attainment status of the SCAB for the criteria pollutants. With respect to federal air quality standards, the USEPA classifies the SCAB as in attainment for PM_{10}, CO, NO_2, SO_2, and lead, and in nonattainment for 8-hour ozone and $PM_{2.5}$.

Table 3
SOUTH COAST AIR BASIN ATTAINMENT STATUS
(RIVERSIDE COUNTY PORTION)

Criteria Pollutant	Federal Designation	State Designation
O_3 (1-hour)	(No federal standard)	Nonattainment
O_3 (8-hour)	Extreme Nonattainment	Nonattainment
CO	Attainment (Maintenance)	Attainment
PM_{10}	Attainment (Maintenance)	Nonattainment
$PM_{2.5}$	Serious Nonattainment	Nonattainment
NO_2	Attainment (Maintenance)	Attainment
SO_2	Unclassifiable/Attainment	Unclassifiable/Attainment
Lead	Attainment	Attainment
Sulfates	(No federal standard)	Attainment
Hydrogen Sulfide	(No federal standard)	Attainment
Visibility	(No federal standard)	Attainment

Source: SCAQMD 2016a

2.1.3 California Air Quality Regulations

2.1.3.1 California Clean Air Act

The federal CAA allows states to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. CARB, a part of the CalEPA, is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the California Ambient Air Quality Standards (CAAQS). CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

In addition to primary and secondary AAQS, the state has established a set of episode criteria for ozone, CO, NO_2, SO_2, and PM. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health. Table 3, above, lists the state attainment status of the SCAB for the criteria pollutants. Under state designation, the SCAB is currently in attainment for CO, $NO_{2,}$ $SO_{2,}$ and lead; and in nonattainment for ozone, $PM_{10,}$ and $PM_{2.5}$.

2.1.3.2 State Implementation Plan

The CAA requires areas with unhealthy levels of ozone, inhalable particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide to develop plans, known as State Implementation Plans (SIPs). SIPs are comprehensive plans that describe how an area will attain the NAAQS. The 1990 amendments to the CAA set deadlines for attainment based on the severity of an area’s air pollution problem.

SIPs are not single documents—they are a compilation of new and previously submitted plans, programs (e.g., monitoring, modeling, permitting), district rules, state regulations and federal controls. Many of California’s SIPs rely on a core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations and limits on emissions from consumer products. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB forwards the SIP revisions to the USEPA for approval and publication in the Federal Register. The Code of Federal Regulations (CFR) Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items that are included in the California SIP (CARB 2009). At any one time, several California submittals are pending USEPA approval.

2.1.3.3 California Energy Code

California Code of Regulations (CCR) Title 24 Part 6, California's Energy Efficiency Standards for Residential and Nonresidential Buildings, were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Energy-efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for space and water heating) results primarily in GHG emissions.

2.1.4 Local Regulations

2.1.4.1 South Coast Air Quality Management District

Air quality in the non-desert portion of Riverside County is regulated by the SCAQMD. As a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), County transportation commissions, and local governments and cooperates actively with all federal and state government agencies. The SCAQMD develops rules and regulations; establishes permitting requirements for stationary sources; inspects emissions sources; and enforces such measures through educational programs or fines, when necessary.

Air Quality Management Plan

The SCAQMD is directly responsible for reducing emissions from stationary (area and point), mobile, and indirect sources. It has responded to this requirement by preparing a sequence of Air Quality Management Plans (AQMP).

On March 3, 2017, the SCAQMD adopted the 2016 AQMP, which is a regional and multi-agency effort (SCAQMD, CARB, SCAG, and USEPA). The 2016 AQMP represents a comprehensive analysis of emissions, meteorology, atmospheric chemistry, regional growth projections, and the impact of existing control measures. The plan seeks to achieve multiple goals in partnership with other entities promoting reductions in criteria pollutant, GHGs, and toxic risk, as well as efficiencies in energy use, transportation, and goods movement (SCAQMD 2017).

The AQMP, in combination with those from all other California nonattainment areas with serious (or worse) air quality problems, is submitted to CARB, which develops the California SIP. The SIP relies on the same information from SCAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The current federal and state attainment status for the SCAB is presented above, in Table 3.

Rules and Regulations

The following rules promulgated by the SCAQMD would be applicable to construction and/or operation of the Project.

Rule 401 – Visible Emissions: Limits the allowable opacity of air contaminant emissions from any single source (SCAQMD 2001).

Rule 402 – Nuisance: Prohibits the discharge of air contaminants, including odors, which cause injury, detriment, nuisance, or annoyance to any considerable number of persons (SCAQMD 1976).

Rule 403 – Fugitive Dust: Requires actions to prevent, reduce or mitigate anthropogenic fugitive dust emissions, including emissions from construction activities. Project construction would be required to implement all applicable fugitive dust best available control measures specified in Table 1 in the rule (SCAQMD 2005).

Rule 1113 – Architectural Coating: Establishes VOC limits for architectural coatings (e.g., paints, stains, preservatives). Effective January 1, 2019, building interior and exterior paint is limited to a maximum VOC content of 50 grams per liter (SCAQMD 2016b).

2.2 GREENHOUSE GASES

2.2.1 Climate Change Overview

Global climate change refers to changes in average climatic conditions on Earth including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by atmospheric gases. These gases are commonly referred to as GHGs because they function like a greenhouse by letting sunlight in but preventing heat from escaping, thus warming the Earth's atmosphere.

GHGs are emitted by natural processes and human (anthropogenic) activities. Anthropogenic GHG emissions are primarily associated with: (1) the burning of fossil fuels during motorized transport, electricity generation, natural gas consumption, industrial activity, manufacturing, and other activities; (2) deforestation; (3) agricultural activity; and (4) solid waste decomposition.

The temperature record shows a decades-long trend of warming, with 2016 global surface temperatures ranking as the warmest year on record since 1880. A recent release in long-term warming trends announced 2020 ranked as tied with 2016 for the warmest year on record with an increase of 1.84 degrees Fahrenheit compared to the 1951-1980 average (National Aeronautics and Space Administration [NASA] 2021). The most recent release announced 2021 ranked as tied with 2018 for the sixth warmest year on record (NASA 2022). GHG emissions from human activities are the most significant driver of observed climate change since the mid-20th century (United Nations Intergovernmental Panel on Climate Change [IPCC] 2013). The IPCC constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The statistical models show a "high confidence" that temperature increase caused by anthropogenic GHG emissions could be kept to less than two degrees Celsius relative to pre-industrial levels if atmospheric concentrations are stabilized at about 450 parts per million (ppm) carbon dioxide equivalent (Co_2e) by the year 2100 (IPCC 2014).

2.2.2 Types of Greenhouse Gases

The GHGs defined under California's AB 32 include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Carbon Dioxide. CO_2 is the most important and common anthropogenic GHG. CO_2 is an odorless, colorless GHG. Natural sources include the decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungi; evaporation from oceans; and volcanic outgassing. Anthropogenic sources of CO_2 include burning fuels, such as coal, oil, natural gas, and wood. Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. The atmospheric CO_2 concentration in 2010 was 390 ppm, 39 percent above the concentration at the start of the Industrial Revolution (approximately 280 ppm in 1750). In January 2022, the CO_2 concentration was 418 ppm, a 49 percent increase since 1750 (National Oceanic and Atmospheric Administration [NOAA] 2022).

Methane. CH_4 is the main component of natural gas used in homes. A natural source of methane is from the decay of organic matter. Geological deposits known as natural gas fields contain methane, which is extracted for fuel. Other sources are from decay of organic material in landfills, fermentation of manure, and cattle digestion.

Nitrous Oxide. N_2O is produced by both natural and human-related sources. N_2O is emitted during agricultural and industrial activities, as well as during the combustion of fossil fuels and solid waste. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic (fatty) acid production, and nitric acid production.

Hydrofluorocarbons. Fluorocarbons are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at Earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, their production was stopped as required by the 1989 Montreal Protocol.

Sulfur Hexafluoride. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semi-conductor manufacturing, and as a tracer gas for leak detection.

GHGs have long atmospheric lifetimes that range from one year to several thousand years. Long atmospheric lifetimes allow for GHG emissions to disperse around the globe. Because GHG emissions vary widely in the power of their climatic effects, climate scientists have established a unit called global warming potential (GWP). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, a gas with a GWP of 10 is 10 times more potent than CO_2 over 100 years. CO_2e is a quantity that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e.

Historically, GHG emission inventories have been calculated using the GWPs from the IPCC's Second Assessment Report (SAR). In 2007, IPCC updated the GWP values based on the latest science at the time in its Fourth Assessment Report (AR4). The updated GWPs in the IPCC AR4 have begun to be used in recent GHG emissions inventories. In 2013, IPCC again updated the GWP values based on the latest science in its Fifth Assessment Report (AR5) (IPCC 2013). However, United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines for national inventories require the use of GWP values from the AR4. To comply with international reporting standards under the UNFCCC, official emission estimates for California and the U.S. are reported using AR4 GWP values, and statewide and national GHG inventories have not yet updated their GWP values to the AR5 values. Project GHG emissions in this analysis are reported using the AR4 GWP values.

By applying the GWP ratios, Project-related CO_2e emissions can be tabulated in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 4, *Global Warming Potentials and Atmospheric Lifetimes*.

Table 4
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES

Greenhouse Gas	Atmospheric Lifetime (years)	IPCC SAR GWP	IPCC AR4 GWP	IPCC AR5 GWP
Carbon Dioxide (CO_2)	50-200	1	1	1
Methane (CH_4)	12	21	25	28
Nitrous Oxide (N_2O)	114	310	298	265
HFC-134a	14	1,300	1,430	1,300
PFC: Tetraflouromethane (CF_4)	50,000	6,500	7,390	6,630
PFC: Hexafluoroethane (C_2F_6)	10,000	9,200	12,200	11,100
Sulfur Hexafluoride (SF_6)	3,200	23,900	22,800	23,500

Source: IPCC 2007
IPCC = Intergovernmental Panel on Climate Change; GWP = global warming potential; HFC = hydrofluorocarbon; PFC = perfluorocarbon

2.2.3 Federal Greenhouse Gas Regulations

2.2.3.1 Federal Clean Air Act

The U.S. Supreme Court ruled on April 2, 2007, in *Massachusetts v. U.S. Environmental Protection Agency* that CO_2 is an air pollutant, as defined under the CAA, and that the USEPA has the authority to regulate emissions of GHGs. The USEPA announced that GHGs (including CO_2, CH_4, N_2O, HFC, PFC, and SF_6) threaten the public health and welfare of the American people (USEPA 2021). This action was a prerequisite to finalizing the USEPA's GHG emissions standards for light-duty vehicles, which were jointly proposed by the USEPA and the United States Department of Transportation's National Highway Traffic Safety Administration (NHTSA).

2.2.3.2 Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards

The USEPA and the NHTSA worked together on developing a national program of regulations to reduce GHG emissions and to improve fuel economy of light-duty vehicles. The USEPA established the first-ever national GHG emissions standards under the CAA, and the NHTSA established Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act. On April 1, 2010, the USEPA and NHTSA announced a joint Final Rulemaking that established standards for 2012 through 2016 model year vehicles. This was followed up on October 15, 2012, when the agencies issued a Final Rulemaking with standards for model years 2017 through 2025. On March 3, 2020, the agencies released the final Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks (SAFE Vehicles Rule). The purpose of the SAFE Vehicles Rule is "to correct the national automobile fuel economy and GHG emissions standards to give the American people greater access to safer, more affordable vehicles that are cleaner for the environment." The direct effect of the rule is to eliminate the standards that were put in place to gradually raise average fuel economy for passenger cars and light trucks under test conditions from 37 miles per gallon (mpg) in 2020 to 50 mpg in 2025. The new SAFE Vehicles Rule freezes the average fuel economy level standards indefinitely at the 2020 levels. The new SAFE Vehicles Rule also results in the withdraw of the waiver previously provided to California for that State's GHG and zero emissions vehicle (ZEV) programs under Section 209 of the CAA (USEPA and NHTSA 2020). The SAFE Vehicles Rule Part I (SAFE-1), which withdraws the waiver, was published in September 2019 and Part II (SAFE-2), which finalizes the regulation, was published in April 2020. On April 26, 2021, the USEPA published the Notice of Reconsideration of Previous Withdrawal of a Waiver for California's Advanced Clean Car Program. The purpose of this Notice of Reconsideration is to seek comment on a number of issues in the SAFE-1 action including:

- Whether it was proper for the USEPA to reconsider a previously issued CAA waiver.
- Whether USEPA's actions to withdraw California's waiver was appropriate.
- Whether the SAFE-1 interpretation of the CAA that enabled USEPA to withdraw California's waiver was appropriate.
- Whether the SAFE-1 interpretation of CAA Section 177 that could disallow other states' ability to adopt California GHG emission standards was appropriate.

2.2.4 California Greenhouse Gas Regulations

2.2.4.1 California Code of Regulations, Title 24, Part 6

CCR Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Energy-efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for space or water heating) results in GHG emissions.

The Title 24 standards are updated approximately every three years to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 2019 Title 24 standards went into effect on January 1, 2020. The 2019 update to the Building Energy Efficiency Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings (California Energy Commission [CEC] 2019).

The standards are divided into three basic sets. First, there is a basic set of mandatory requirements that apply to all buildings. Second, there is a set of performance standards—the energy budgets—that vary by climate zone (of which there are 16 in California) and building type; thus, the standards are tailored to local conditions. Finally, the third set constitutes an alternative to the performance standards, which is a set of prescriptive packages that are basically a recipe or a checklist compliance approach.

2.2.4.2 California Green Building Standards Code

The California Green Building Standards Code (CALGreen; CCR Title 24, Part 11) is a code with mandatory requirements for all nonresidential buildings (including industrial buildings) and residential buildings for which no other state agency has authority to adopt green building standards. The current 2019

Standards for new construction of, and additions and alterations to, residential and nonresidential buildings went into effect on January 1, 2020 (California Building Standards Commission [CBSC] 2019).

The development of CALGreen is intended to (1) cause a reduction in GHG emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

CALGreen contains requirements for storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for the verification that all building systems, like heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

2.2.4.3 Executive Order S-3-05

On June 1, 2005, Executive Order (EO) S-3-05 proclaimed that California is vulnerable to climate change impacts. It declared that increased temperatures could reduce snowpack in the Sierra Nevada, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To avoid or reduce climate change impacts, EO S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

2.2.4.4 Assembly Bill 32 – Global Warming Solution Act of 2006

The California Global Warming Solutions Act of 2006, widely known as Assembly Bill (AB) 32, requires that CARB develop and enforce regulations for the reporting and verification of statewide GHG emissions. CARB is directed by AB 32 to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

2.2.4.5 Executive Order B-30-15

On April 29, 2015, EO B-30-15 established a California GHG emission reduction target of 40 percent below 1990 levels by 2030. The EO aligns California's GHG emission reduction targets with those of leading international governments, including the 28 nation European Union. California is on track to meet or exceed the target of reducing GHGs emissions to 1990 levels by 2020, as established in AB 32. California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the goal established by EO S-3-05 of reducing emissions 80 percent under 1990 levels by 2050.

2.2.4.6 Senate Bill 32

Senate Bill (SB) 32 (Amendments to the California Global Warming Solutions Action of 2006) extends California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EO B-30-15 of 80 percent below 1990 emissions levels by 2050.

2.2.4.7 Assembly Bill 197

A condition of approval for SB 32 was the passage of AB 197. AB 197 requires that CARB consider the social costs of GHG emissions and prioritize direct reductions in GHG emissions at mobile sources and large stationary sources. AB 197 also gives the California legislature more oversight over CARB through the addition of two legislatively appointed members to the CARB Board and the establishment a legislative committee to make recommendations about CARB programs to the legislature.

2.2.4.8 Assembly Bill 1493 – Vehicular Emissions of Greenhouse Gases

AB 1493 (Pavley) requires that CARB develop and adopt regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State." On September 24, 2009, CARB adopted amendments to the Pavley regulations that intend to reduce GHG emissions in new passenger vehicles from 2009 through 2016. The amendments bind California's enforcement of AB 1493 (starting in 2009), while providing vehicle manufacturers with new compliance flexibility. In January 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single packet of standards called Advanced Clean Cars (CARB 2021b).

2.2.4.9 Assembly Bill 341

The state legislature enacted AB 341 (California Public Resource Code Section 42649.2), increasing the diversion target to 75 percent statewide. AB 341 requires all businesses and public entities that generate 4 cubic yards or more of waste per week to have a recycling program in place. The final regulation was approved by the Office of Administrative Law on May 7, 2012 and went into effect on July 1, 2012.

2.2.4.10 Executive Order S-01-07

This EO, signed by Governor Schwarzenegger on January 18, 2007, directs that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by the year 2020. It orders that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California and directs CARB to determine whether a LCFS can be adopted as a discrete early action measure pursuant to AB 32. CARB approved the LCFS as a discrete early action item with a regulation adopted and implemented in April 2010. Although challenged in 2011, the Ninth Circuit reversed the District Court's opinion and rejected arguments that implementing LCFS violates the interstate commerce clause in September 2013. CARB is therefore continuing to implement the LCFS statewide.

2.2.4.11 Senate Bill 350

Approved by Governor Brown on October 7, 2015, SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. This will increase the use of Renewables Portfolio Standard eligible resources, including solar, wind, biomass, and geothermal. In addition, large utilities are required to develop and submit Integrated Resource Plans to detail how each entity will meet their customers resource needs, reduce GHG emissions, and increase the use of clean energy.

2.2.4.12 Senate Bill 375

SB 375, the Sustainable Communities and Climate Protection Act of 2008, supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities.

Under the Sustainable Communities Act, CARB sets regional targets for GHG emissions reductions from passenger vehicle use. In 2010, CARB established these targets for 2020 and 2035 for each region covered by one of the State's metropolitan planning organizations (MPOs). CARB periodically reviews and updates the targets, as needed.

Each of California's MPOs must prepare a Sustainable Communities Strategy (SCS) as an integral part of its regional transportation plan (RTP). The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. Once adopted by the MPO, the RTP/SCS guides the transportation policies and investments for the region. CARB must review the adopted SCS to confirm and accept the MPO's determination that the SCS, if implemented, would meet the regional GHG targets. If the combination of measures in the SCS would not meet the regional targets, the MPO must prepare a separate alternative planning strategy (APS) to meet the targets. The APS is not a part of the RTP. Qualified projects consistent with an approved SCS or Alternative Planning Strategy categorized as “transit priority projects” would receive incentives to streamline CEQA processing.

2.2.4.13 Senate Bill 100

Approved by Governor Brown on September 10, 2018, SB 100 extends the renewable electricity procurement goals and requirements of SB 350. SB 100 requires that all retail sale of electricity to California end-use customers be procured from 100 percent eligible renewable energy resources and zero-carbon resources by the end of 2045.

2.2.4.14 California Air Resources Board: Scoping Plan

On December 11, 2008, the CARB adopted the Scoping Plan (CARB 2008) as directed by AB 32. The Scoping Plan proposes a set of actions designed to reduce overall GHG emissions in California to the levels required by AB 32. Measures applicable to development projects include those related to energy-efficiency building and appliance standards, the use of renewable sources for electricity generation, regional transportation targets, and green building strategy. Relative to transportation, the Scoping Plan includes nine measures or recommended actions related to reducing vehicle miles traveled (VMT) and vehicle GHGs through fuel and efficiency measures. These measures would be implemented statewide rather than on a project-by-project basis.

In response to EO B-30-15 and SB 32, all state agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. CARB was directed to update the Scoping Plan to reflect the 2030 target and, therefore, is moving forward with the update process (CARB 2014). The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue driving down emissions. CARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target set by EO B-30-15 and codified by SB 32. The 2017 Climate Change Scoping Plan Update, Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target, was adopted in December 2017. The Scoping Plan Update establishes a proposed framework for California to meet a 40 percent reduction in GHGs by 2030 compared to 1990 levels (CARB 2017).

2.2.5 Regional GHG Policies and Plans

2.2.5.1 Southern California Association of Governments

Menifee is a member city of SCAG. SCAG's Connect SoCal 2020–2045 RTP/SCS, adopted September 3, 2020, is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The RTP/SCS embodies a collective vision for the region's future and is developed with input from local governments, county transportation commissions, tribal governments, nonprofit organizations, businesses, and local stakeholders in Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties.

The RTP/SCS establishes GHG emissions goals for automobiles and light-duty trucks for 2020 and 2035 and establishes an overall GHG target for the region consistent with both the statewide GHG-reduction targets for 2020 and the post-2020 statewide GHG reduction goals.

2.2.5.2 Western Riverside Council of Governments

In September 2014, the Western Riverside Council of Governments (WRCOG) completed the Subregional Climate Action Plan (Subregional CAP). The Subregional CAP is a joint effort by twelve cities in the subregion which establishes emissions reduction targets, emissions reduction measures, and action steps to assist each community to demonstrate consistency AB 32 (WRCOG 2014). The City of Menifee was not a participating agency in developing (and has not adopted) the Subregional CAP.

2.2.5.3 Riverside County

Riverside County developed a CAP that was first adopted in December 2015 (County 2015). The 2019 CAP Update was approved on December 17, 2019 (County 2019). The 2019 CAP Update refines the County's efforts to meet GHG reduction strategies, specifically for the years 2035 and 2050. The 2019 CAP Update builds upon the GHG reduction strategies in the 2015 CAP. The implementation of the CAP will also help lead agencies to assess cumulative impacts of a project and provide a means for future projects to address GHG impacts under CEQA. A lead agency may conclude that a project's GHG impact is not cumulatively significant if the project demonstrates consistency with the CAP (CEQA Guidelines Section 15183.5[h][3]).

Through the CAP, Riverside County has established goals and policies that incorporate environmental responsibility into its daily management of residential, commercial, and industrial growth, education, energy and water use, air quality, transportation, waste reduction, economic development and open space and natural habitats to further their commitment. Following the state's adopted AB 32 GHG reduction target, Riverside County has set a goal to reduce emissions back to 1990 levels by the year 2020. This target was calculated as a 15 percent decrease from 2008 levels, as recommended in the AB 32 Scoping Plan. The estimated community-wide emissions for the year 2020, based on population and housing growth projections associated with the assumptions used in the proposed General Plan Update, are 12,129,497 MT CO_2e. To reach the reduction target, the County must offset this growth in emissions and reduce community-wide emissions to 5,960,998 MT CO_2e by the year 2020.

Since the 2015 CAP adoption, new legislation and several policies have been proposed, such as EO B-30-15 and SB 32 that extended the goals of AB 32 and set a 2030 goal of reducing emissions to 40 percent below 1990 levels by 2030. Further, the emissions reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. The 2019 CAP Update re-evaluates the County's GHG reduction targets and strategies. The new goals and supporting measures are proposed to reflect and ensure compliance with changes in the local and State policies and regulations such as SB 32 and California's 2017 Climate Change Scoping Plan.

To reach the reduction target, the County has included additional local reduction measures in the CAP that encourage energy efficiency and renewable energy in buildings, transit-oriented planning, water conservation, and increased waste diversion.

3.0 EXISTING CONDITIONS

The Project site is in a rural area with open space to the north, south, and east and rural residential uses to the west. The Project site is primarily undeveloped, with the exception of the existing water tanks and associated facilities in the southeast portion of the site. See Figure 2.

3.1 CLIMATE AND METEOROLOGY

The Project site is in the SCAB, which consists of all or part of four counties: Los Angeles, San Bernardino, Riverside, and Orange. The distinctive climate of the SCAB is determined by its terrain and geographic location. The SCAB is a coastal plain with connecting broad valleys and low hills. It is bound by the Pacific Ocean to the southwest and high mountains around the rest of its perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light, average wind speeds.

The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds. Winds in the Project area are usually driven by the dominant land/ sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes. At night, the wind generally slows and reverses direction traveling toward the sea. Local canyons can also alter wind direction, with wind tending to flow parallel to the canyons. The vertical dispersion of air pollutants in the SCAB is hampered by the presence of persistent temperature inversions. High pressure systems, such as the semi-permanent high-pressure zone in which the SCAB is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog. The basin-wide occurrence of inversions at 3,500 feet above mean sea level or less averages 191 days per year (SCAQMD 1993).

In Menifee, the summers are hot, arid, and mostly clear; and the winters are long, cold, and partly cloudy (Weatherspark 2022). Over the course of the year, the temperature typically varies from 41°F to 92°F and is rarely below 33°F or above 99°F.

Menifee experiences mild seasonal variation over the course of the year. The windier part of the year occurs in the winter and spring with average wind speeds of more than 5.6 miles per hour (mph). The windiest month of the year in Menifee is April, with an average hourly wind speed of 6.4 mph. Summer and fall wind conditions tend to be lower. The calmest month of the year in Menifee is September, with an average hourly wind speed of 4.8 mph.

Summers may have average daily high temperature above 86°F. The hottest month of the year in Menifee is August, with an average high of 92°F and low of 64°F. Winters may have an average daily high temperature below 70°F. The coldest month of the year in Menifee is December, with an average low of 42°F and high of 65°F.

The rainy period of the year occurs from October to April. The month with the most rain in Menifee is February, with an average rainfall of 2.5 inches. The rainless period of the year occurs from April to October. The month with the least rain in Menifee is June, with an average rainfall of 0.1 inch.

3.2 SENSITIVE RECEPTORS

CARB and the Office of Environmental Health Hazard Assessment (OEHHA) have identified the following groups of individuals as the most likely to be affected by air pollution: adults over 65, children under 14, infants (including in utero in the third trimester of pregnancy), and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis (CARB 2005; OEHHA 2015). Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved and are referred to as sensitive receptor locations. Examples of these sensitive receptor locations are residences, schools, hospitals, and daycare centers. For health risk assessments, the health impacts are analyzed for individual residents assumed to be standing in their primary outdoor spaces closest to the source of TACs, for students assumed to be standing outside of the school buildings or in outdoor recreation areas closest to the source of TACs, and for individual off-site workers assumed to be standing outside of a commercial or industrial building.

The closest existing sensitive receptor location to the Project site is the single-family residence immediately southwest of the Project site. Additional residential sensitive receptors are located further to the west.

3.3 EXISTING AIR QUALITY

3.3.1 Criteria Pollutants

3.3.1.1 Attainment Designations

Attainment designations are discussed in Section 2.1 and Table 2. The SCAB is a federal and state nonattainment area for 8-hour ozone and $PM_{2.5}$. The SCAB is also a state nonattainment area for 1-hour ozone and PM_{10}.

3.3.1.2 Monitored Air Quality

The SCAQMD maintains monitoring stations to measure ambient concentrations of pollutants in the SCAB. The nearest monitoring station, approximately 5.5 miles north of the Project site, is the Perris monitoring station. The closest monitoring station with data for $PM_{2.5}$ and NO_2 is the Lake Elsinore – West Flint Street monitoring station, approximately 6.2 miles southwest of the Project site. Table 5, *Air Quality Monitoring Data*, presents a summary of the ambient pollutant concentrations monitored at the two air quality monitoring stations during the most recent three years (2018 through 2020) for which the SCAQMD has reported data.

Table 5
AIR QUALITY MONITORING DATA

Pollutant Standard	2018	2019	2020
Ozone (O_3) – Perris Station			
Maximum concentration 1-hour period (ppm)	0.117	0.118	0.125
Maximum concentration 8-hour period (ppm)	0.103	0.095	0.106
Days above 1-hour state standard (>0.09 ppm)	31	28	34
Days above 8-hour state/federal standard (>0.070 ppm)	67	64	74
Coarse Particulate Matter (PM_{10}) – Perris Station			
Maximum 24-hour concentration (μg/m^3)	64.4	97.0	92.3
Measured Days above 24-hr state standard (>50 μg/m^3)	2	4	6
Measured Days above 24-hr federal standard (>150 μg/m^3)	0	0	0
Annual average (μg/m^3)	28.9	24.4	*
Exceed state annual standard (20 μg/m^3)	Yes	Yes	*
Fine Particulate Matter ($PM_{2.5}$) – Lake Elsinore Station			
Maximum 24-hour concentration (μg/m^3)	31.3	17.6	41.6
Measured Days above 24-hour federal standard (>35 μg/m^3)	*	*	*
Annual average (μg/m^3)	6.7	*	7.2
Exceed state and federal annual standard (12 μg/m^3)	No	*	No
Nitrogen Dioxide (NO_2) – Lake Elsinore Station			
Maximum 1-hour concentration (ppm)	0.041	0.038	0.044
Days above state 1-hour standard (0.18 ppm)	0	0	0
Days above federal 1-hour standard (0.100 ppm)	0	0	0
Annual average (ppm)	0.008	0.006	0.007
Exceed annual federal standard (0.053 ppm)	No	No	No
Exceed annual state standard (0.030 ppm)	No	No	No

Source: CARB 2022
ppb = parts per billion; ppm = parts per million; μg/m^3 = micrograms per cubic meter, * = insufficient data available.

As shown in Table 5, the 1- and 8-hour ozone, and PM_{10} standards were exceeded numerous times in each of the sample years. Data for NO_2 and $PM_{2.5}$ showed no exceedances.

3.3.2 Greenhouse Gases

In 2014, total GHG emissions worldwide were estimated at 48,892 million metric tons (MMT) of CO_2e emissions (World Resource Institute [WRI] 2020). The U.S. contributed the second largest portion (13 percent) of global GHG emissions in 2014. The total U.S. GHG emissions was 6,319 MMT CO_2e in 2019, of which 82 percent was CO_2 emission (WRI 2020). On a national level, approximately 27 percent of GHG emissions were associated with transportation and about 38 percent were associated with electricity generation (WRI 2020).

CARB performed statewide inventories for the years 1990 to 2019, as shown in Table 6, *California Greenhouse Gas Emissions by Sector*. The inventory is divided into five broad sectors of economic activity: agriculture, commercial and residential, electricity generation, industrial, and transportation. Emissions are quantified in MMT CO_2e.

Table 6
CALIFORNIA GREENHOUSE GAS EMISSIONS BY SECTOR

Sector	Emissions (MMT CO_2e) 1990	Emissions (MMT CO_2e) 2000	Emissions (MMT CO_2e) 2010	Emissions (MMT CO_2e) 2019
Agriculture and Forestry	18.9 (4%)	31.0 (7%)	33.7 (8%)	31.8 (8%)
Commercial and Residential	44.1 (10%)	45.8 (10%)	52.2 (12%)	43.8 (10%)
Electricity Generation	110.5 (26%)	105.4 (22%)	90.6 (20%)	58.8 (14%)
Industrial	105.3 (24%)	105.8 (22%)	101.8 (23%)	88.2 (21%)
Transportation	150.6 (35%)	183.2 (39%)	170.2 (38%)	166.1 (40%)
Unspecified Remaining	1.3 (<1%)	0.0 (0%)	0.0 (0%)	29.5 (7%)
TOTAL	**430.7**	**471.1**	**448.5**	**418.2**

Source: CARB 2007 and CARB 2021c
MMT = million metric tons; CO_2e = carbon dioxide equivalent

As shown in Table 6, statewide GHG source emissions totaled 431 MMT CO_2e in 1990, 471 MMT CO_2e in 2000, 449 MMT CO_2e in 2010, and 418 MMT CO_2e in 2019. Transportation-related emissions consistently contribute the most GHG emissions, followed by electricity generation and industrial emissions (CARB 2007 and CARB 2021c).

4.0 METHODOLOGY AND SIGNIFICANCE CRITERIA

4.1 METHODOLOGY

Criteria pollutant and GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod), Version 2020.4.0 CalEEMod is a computer model used to estimate air emissions resulting from land development projects throughout the state of California. CalEEMod was developed by CAPCOA in collaboration with the California air quality management and pollution control districts, primarily the SCAQMD. The calculation methodology, source of emission factors used, and default data is described in the CalEEMod User's Guide, and Appendices A, D, and E (CAPCOA 2021b).

In brief, CalEEMod is a computer model that estimates criteria air pollutant and greenhouse gas emissions from mobile (i.e., vehicular) sources, area sources (fireplaces, woodstoves, and landscape maintenance equipment), energy use (electricity and natural gas used in space heating, ventilation, and cooling; lighting; and plug-in appliances), water use and wastewater generation, and solid waste disposal. Emissions are estimated based on land use information input to the model by the user.

In the first module, the user defines the specific land uses that will occur at the project site. The user also selects the appropriate land use setting (urban or rural), operational year, location, climate zone, and utility provider. The input land uses, size features, and population are used throughout CalEEMod in determining default parameters and calculations in each of the subsequent modules. The input land use information consists of land use subtypes (such as the residential subtypes of single-family residential and multi-family medium-rise residential) and their unit or square footage quantities.

Subsequent modules include construction (including off-road vehicle emissions), mobile (on-road vehicle emissions), area sources (architectural coatings [painting], consumer products [cleansers, aerosols, solvents]), water and wastewater, and solid waste. Each module comprises multiple components including an associated mitigation module to account for further reductions in the reported baseline calculations. Other inputs include trip generation rates, trip lengths, vehicle fleet mix (percentage autos, trucks, etc.), trip distribution (percent work to home, etc.), duration of construction phases, construction equipment usage, grading areas, season, and ambient temperature, as well as other parameters.

In various places the user can input additional information and/or override the default assumptions to account for project- or location-specific parameters. For this assessment, the default parameters were not changed unless otherwise noted. The CalEEMod output files are included in Appendix A to this report.

4.1.1 Construction Emissions

CalEEMod has the capability to calculate reductions in construction emissions from the effects of dust control, diesel-engine classifications, and other selected emissions reduction measures. In compliance with SCAQMD Rule 403, fugitive dust emissions calculations assume application of water on exposed surface a minimum of two times per day. Based on CalEEMod, Version 2020.4.0 defaults, the control efficiency for watering two times per day is 55 percent.

CalEEMod estimates construction emissions for each year of construction activity based on the annual construction equipment profile and other factors determined as needed to complete all phases of construction by the target completion year. As such, each year of construction activity has varying quantities of GHG emissions. Per SCAQMD guidance, total construction GHG emissions resulting from the Project are amortized over 30 years (the anticipated period before the Project would require replacement or significant renovation) and added to operational GHG emissions.

4.1.1.1 Construction Activities

Construction emissions were estimated based on a combination of the general timeline provided by the Project applicant in addition to CalEEMod defaults. It was assumed that construction would commence with demolition in March 2023 and the remaining phases would occur concurrently. Installation of underground utilities was assumed to occur during grading activities. The quantity, duration, and intensity of construction activity influence the amount of construction emissions and related pollutant concentrations that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction activity is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of: (1) a more modern and cleaner-burning construction equipment fleet mix than assumed in CalEEMod; and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval).

Construction activities would include demolition, site preparation, grading, building construction, paving, and architectural coatings. Installation of underground utilities are included in the grading activities. Construction is assumed to occur five days per week with equipment operating up to eight hours per day. The construction schedule assumed in the modeling is shown in Table 7, *Anticipated Construction Schedule*.

Table 7
ANTICIPATED CONSTRUCTION SCHEDULE

Construction Activity	Construction Period Start	Construction Period End	Number of Working Days
Demolition	3/23/2023	4/19/2023	20
Site Preparation	4/20/2023	4/26/2023	5
Grading	4/27/2023	6/22/2023	41
Tank Construction	6/23/2023	6/22/2024	261
Paving	6/23/2024	7/22/2024	21
Architectural Coatings	7/23/2024	8/22/2024	23

Source: Pulte Group; CalEEMod (complete data is provided in Appendix A)

4.1.1.2 Construction Off-Road Equipment

Construction would require the use of heavy off-road equipment. Construction equipment estimates for other activities estimates are based on default values in CalEEMod, with additional equipment added based on information provided by the Project applicant. Table 8, *Construction Equipment Assumptions*, presents a summary of the assumed equipment that would be involved in each stage of construction.

Table 8
CONSTRUCTION EQUIPMENT ASSUMPTIONS

Equipment	Horsepower	Number	Hours/Day
Demolition			
Concrete/Industrial Saws	81	1	8
Excavators	158	3	8
Rubber Tired Dozers	247	2	8
Water Trucks	189	1	8
Haul Trucks	402	1	8
Site Preparation			
Rubber Tired Dozers	247	2	8
Tractors/Loaders/Backhoes	97	4	8
Water Trucks	189	1	8
Haul Trucks	402	1	8
Grading			
Excavators	158	1	8
Graders	187	1	8
Rubber Tired Dozers	247	2	8
Water Trucks	189	1	8
Tractors/Loaders/Backhoes	97	3	8
Tank Construction			
Cranes	231	1	7
Forklifts	89	3	8
Tractors/Loaders/Backhoes	97	3	7
Welders	46	1	8
Concrete Pump Trucks	402	1	8
Concrete Mixer Trucks	402	1	8

Equipment	Horsepower	Number	Hours/Day
Paving			
Pavers	130	1	8
Paving Equipment	132	2	6
Rollers	80	1	6
Cement and Mortar Mixers	9	2	6
Tractors/Loaders/Backhoes	97	1	8
Architectural Coating			
Air Compressors	78	1	6

Source: Pulte Group; CalEEMod (complete data is provided in Appendix A)

4.1.1.3 Construction On-Road Trips

Worker commute trips and vendor delivery trips were modeled based on CalEEMod defaults. Worker trips are anticipated to vary between 1 and 20 trips per day, depending on construction activity. During demolition and site prep, materials would be hauled to an on-site location, so haul trucks are incorporated into the off-road construction analysis above and are excluded from the on-road trip analysis. During grading, the Project is anticipated to require the import of 22,636 CY of soil resulting in a total of 2,830 trips over the course of the grading phase. The CalEEMod default worker, vendor and haul trip distances were used in the model.

4.1.2 Operation Emissions

The Project involves the construction of a potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure. The Project would result in minimal operational emissions; therefore, operational impacts are evaluated qualitatively.

4.1.3 Localized Significance Threshold Methodology

As part of the SCAQMD's environmental justice program, more attention has been focused on localized air quality effects. Also, while regional impact analysis is based on attaining or maintaining regional emissions standards, localized impact analysis compares the concentration of a pollutant at a receptor site to a health-based standard.

SCAQMD has developed a localized significance threshold (LST) methodology and mass rate look-up tables by source receptor area (SRA) that can be used by public agencies to determine whether a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard; they are developed based on the ambient concentrations of that pollutant for each SRA (SCAQMD 2009). The LST methodology translates the concentration standards into emissions thresholds that are a function of project site area, source to receptor distance, and the location within the SCAB. The LST methodology is recommended to be limited to projects of 5 acres or less and to avoid the need for complex dispersion modeling. For projects that exceed 5 acres, the 5-acre LST look-up values can be used as a screening tool to determine which pollutants require detailed analysis. This approach is conservative as it assumes that all on-site emissions would occur within a 5-acre area and over-predicts potential localized impacts (i.e., more pollutant emissions occurring within a smaller area and within closer proximity to potential sensitive receptors). If a project exceeds the LST look up values, then the SCAQMD recommends that project-specific localized air quality modeling be performed.

The proposed Project is within SRA 24, Perris Valley. The Project site comprises approximately 5 acres. The closest sensitive receptor is a single-family residence immediately southwest of the Project site. Therefore, the LSTs in SRA 24 for project sites of 5 acres with receptors located within 82 feet (25 meters) are used in this analysis.

4.2 SIGNIFICANCE CRITERIA

4.2.1 Air Quality

Thresholds used to evaluate potential air quality and odor impacts are based on applicable criteria in the State's California Environmental Quality Act (CEQA) Guidelines Appendix G. A significant air quality and/or odor impact could occur if the implementation of the proposed Project would:

1. Conflict with or obstruct implementation of the SCAQMD Air Quality Management Plan, or applicable portions of the SIP; or

2. Result in a cumulatively considerable net increase of any criteria pollutant for which the SCAB is non-attainment under an applicable NAAQS or CAAQS; or

3. Expose sensitive receptors to substantial pollutant concentrations; or

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

Appendix G of the State CEQA Guidelines states that the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. The SCAQMD has established significance thresholds to assess the regional and localized impacts of project-related air pollutant emissions. The significance thresholds are updated, as needed, to appropriately represent the most current technical information and attainment status in the SCAB. Table 9, *SCAQMD Thresholds of Significance*, presents the most current significance thresholds, including regional daily thresholds for short-term construction and long-term operational emissions; maximum incremental cancer risk and hazard indices for TACs; and maximum ambient concentrations for exposure of sensitive receptors to localized pollutants. A project with daily emission rates, risk values, or concentrations below these thresholds is generally considered to have a less than significant effect on air quality.

Table 9
SCAQMD THRESHOLDS OF SIGNIFICANCE

Pollutant	Construction	Operation
Mass Daily Thresholds (pounds per day)		
VOC	75	55
NO_X	100	55
CO	550	550
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
Lead	3	3
Toxic Air Contaminants		
TACs	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Ambient Air Quality for Criteria Pollutants		
NO_2	1-hour average ≥ 0.18 ppm Annual average ≥ 0.03 ppm	
CO	1-hour average ≥ 20.0 ppm (state) 8-hour average ≥ 9.0 ppm (state/federal)	
PM_{10}	24-hour average ≥ 10.4 μg/m^3 (construction) 24-hour average ≥ 2.5 μg/m^3 (operation) Annual average ≥ 1.0 μg/m^3	
$PM_{2.5}$	24-hour average ≥ 10.4 μg/m^3 (construction) 24-hour average ≥ 2.5 μg/m^3 (operation)	
SO_2	1-hour average ≥ 0.075 ppm 24-hour average ≥ 0.04 ppm	

Source: SCAQMD 2019
lbs/day = pounds per day; VOC = volatile organic compound; NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10} = respirable particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = fine particulate matter with a diameter of 2.5 microns or less; SO_X = sulfur oxides; TACs = toxic air contaminants; GHG = greenhouse gas emissions; MT/yr = metric tons per year; CO_2e = carbon dioxide equivalent; NO_2 = nitrogen dioxide; ppm = parts per million; μg/m^3 = micrograms per cubic meter

4.2.2 Greenhouse Gases

Given the relatively small levels of emissions generated by a typical development in relationship to the total amount of GHG emissions generated on a national or global basis, individual development projects are not expected to result in significant, direct impacts with respect to climate change. However, given the magnitude of the impact of GHG emissions on the global climate, GHG emissions from new development could result in significant, cumulative impacts with respect to climate change. Therefore, the potential for a significant GHG impact is limited to cumulative impacts.

According to Appendix G of the CEQA Guidelines, a project would have a significant environmental impact if it would:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The determination of significance is governed by CEQA Guidelines 15064.4, entitled "Determining the Significance of Impacts from Greenhouse Gas Emissions." CEQA Guidelines 15064.4(a) states, "[t]he determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to … [use a quantitative model or qualitative model]" (emphasis added). In turn, CEQA Guidelines 15064.4(b) clarifies that a lead agency should consider "Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project." Therefore, consistent with CEQA Guidelines 15064.4, the GHG analysis for the Project appropriately relies upon a threshold based on the exercise of careful judgement and believed to be appropriate in the context of this Project.

On December 5, 2008, the SCAQMD Governing Board adopted their Interim CEQA Greenhouse Gas Significance Threshold. The policy objective of the SCAQMD's recommended threshold is to achieve an emission capture rate of 90 percent of all new or modified stationary source projects. A GHG significance threshold based on a 90 percent emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change because most projects will be required to implement GHG reduction measures. Further, a 90 percent emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that SCAQMD staff estimates that these GHG emissions would account for slightly less than one percent of the future 2050 statewide GHG emissions target. The SCAQMD has adopted a screening threshold for industrial projects of 10,000 metric tons (MT) CO_2e (SCAQMD 2008).

The City of Menifee does not currently have an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. However, the County of Riverside's CAP establishes a screening level threshold of 3,000 MT CO_2e per year for individual projects. County guidance also recommends including construction emissions (amortized over a typical duration of 30 years) in the comparison to the screening threshold. For projects that exceed this screening level, compliance with the CAP Screening Tables or a reduction of 25 percent over the business as usual scenario must be demonstrated. Therefore, the quantitative analysis provided herein relies upon the County of Riverside's CAP screening level threshold of 3,000 MT CO_2e.

5.0 AIR QUALITY IMPACT ANALYSIS

This section evaluates potential direct impacts of the proposed Project related to the air pollutant emissions. Project-level air quality modeling was completed as part of this analysis. Complete modeling results are included as Appendix A of this report.

5.1 ISSUE 1: CONFLICTS WITH AIR QUALITY PLANS

5.1.1 Impacts

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, economy, community development, and environment. With regard to air quality planning, SCAG has prepared the RTP/SCS, a long-range transportation plan that uses growth forecasts to project trends out over a 20-year period to identify regional transportation strategies to address mobility needs. These growth forecasts form the basis for the land use and transportation control portions of the AQMP. These documents are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. Both the RTP/SCS and AQMP are based, in part, on regional population and employment growth projections originating with County and City General Plans.[2]

The Project site is zoned and designated as PF (Public/Quasi Public Facilities) and would be developed in accordance with those land uses. Additionally, the Project site already includes existing water tanks and associated facilities. Because the Project is consistent with the local general plan and zoning, pursuant to SCAQMD guidelines, the proposed Project is considered consistent with the region’s AQMP. As such, proposed Project-related emissions are accounted for in the AQMP, which is crafted to bring the basin into attainment for all criteria pollutants. Accordingly, the proposed Project would be consistent with the projections in the AQMP, thus resulting in a less than significant impact.

5.1.2 Significance of Impacts

Implementation of the Project would not conflict with or obstruct implementation of the SCAQMD’s AQMP, and the impact would be less than significant.

5.1.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

5.1.4 Significance After Mitigation

Impacts related to conflicts with the applicable air quality plan would be less than significant.

[2] SCAG serves as the federally designated metropolitan planning organization for the southern California region.

5.2 ISSUE 2: CUMULATIVELY CONSIDERABLE NET INCREASE OF NONATTAINMENT CRITERIA POLLUTANTS

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development within the SCAB. The region is a federal and/or state nonattainment area for ozone, PM_{10} and $PM_{2.5}$. In accordance with CEQA Guidelines Section 15064(h)(3), the SCAQMD's approach for assessing cumulative impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the federal and State Clean Air Acts. If a project conflicts with the AQMP, which is intended to bring the SCAB into attainment for all criteria pollutants, that project can be considered cumulatively considerable. Additionally, if the mass regional emissions calculated for a project exceed the applicable SCAQMD daily significance thresholds that are designed to assist the region in attaining the applicable state and national ambient air quality standards, that project can be considered cumulatively considerable. As discussed in Issue 1, above, the Project would not conflict with or obstruct implementation of the AQMP. A comparison of the Project mass regional emissions with the applicable SCAQMD daily significance thresholds is provided below.

5.2.1 Impacts

To determine whether a project would result in cumulatively considerable emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation, a project's emissions are evaluated based on the quantitative emission thresholds established by the SCAQMD (as shown in Table 9). An analysis of criteria pollutants and precursors generated during in the short-term during construction and the long-term during operation is provided below.

5.2.1.1 Construction

The Project's construction emissions were estimated using the CalEEMod model as described in Section 4.1.1. Additional details of phasing, selection of construction equipment, and other input parameters, including CalEEMod data, are included in Appendix A.

The results of the calculations for Project construction are shown in Table 10, *Maximum Daily Construction Emissions*. The data are presented as the maximum anticipated daily emissions for comparison with the SCAQMD thresholds.

Table 10
MAXIMUM DAILY CONSTRUCTION EMISSIONS

Phase	ROG (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Demolition	2.9	25.1	23.8	<0.1	1.5	1.1
Site Preparation	2.6	24.0	19.3	<0.1	7.3	4.1
Grading	2.6	34.0	21.1	<0.1	8.8	4.5
Building Construction (2023)	2.3	18.9	19.3	<0.1	0.9	0.8
Building Construction (2024)	2.2	17.6	19.2	<0.1	0.8	0.7
Paving	0.8	7.2	11.5	<0.1	0.6	0.4
Architectural Coatings	3.3	1.2	1.8	<0.1	<0.1	<0.1
Maximum Daily Emissions	**3.3**	**34.0**	**23.8**	**0.1**	**8.8**	**4.5**
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Significant Impact?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix A)
lbs/day = pounds per day; ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

As shown in Table 10, construction period emissions of criteria pollutants and precursors would not exceed the SCAQMD significance thresholds.

5.2.1.2 Operation

Once construction activity is complete, there would be no long-term emissions associated with the Project; the Project would not result in increased vehicle trips or energy demand. Therefore, the proposed Project would not violate air quality standards or contribute substantially to an existing or projected air quality violation. Impacts would be less than significant.

5.2.2 Significance of Impacts

Short-term construction and long-term operation of the Project would not result in criteria pollutant and precursor pollutant emissions that would exceed the SCAQMD significance thresholds, and the impact would be less than significant.

5.2.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

5.2.4 Significance After Mitigation

The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the SCAB is non-attainment, and the impact would less than significant.

5.3 ISSUE 3: IMPACTS TO SENSITIVE RECEPTORS

5.3.1 Impacts

5.3.1.1 Construction Activities

Criteria Pollutants

The localized effects from the on-site portion of daily construction emissions were evaluated at sensitive receptor locations potentially impacted by the Project according to the SCAQMD's LST method, described above. The proposed Project is within SRA 24, Perris Valley. Consistent with the LST guidelines, when quantifying mass emissions for localized analysis, only emissions that occur on site are considered. Emissions related to off-site delivery/haul truck activity and construction worker trips are not considered in the evaluation of construction-related localized impacts, as these do not contribute to emissions generated on a project site. The closest sensitive receptor is the single-family residence adjacent to the northwest corner of the Project site. Therefore, the LSTs in SRA 24 for receptors located less than 82 feet (25 meters) are used for project sites greater than 5 acres. Table 11, *Maximum Localized Daily Construction Emissions*, shows the localized construction emissions.

Table 11
MAXIMUM LOCALIZED DAILY CONSTRUCTION EMISSIONS

Activity	NO_X (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Demolition	25.1	22.9	1.2	1.1
Site Preparation	24.0	18.4	7.0	4.0
Grading	25.1	17.9	7.3	4.1
Building Construction (2023)	18.8	19.2	0.8	0.8
Building Construction (2024)	17.6	19.0	0.7	0.7
Paving	7.1	10.8	0.3	0.3
Architectural Coatings	1.2	1.8	<0.1	<0.1
Maximum Daily Emissions	**25.1**	**22.9**	**7.3**	**4.1**
SCAQMD LST Thresholds (25 meters)	*270*	*1,577*	*13*	*8*
Exceed LST (25 meters)?	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix A)
lbs/day = pounds per day; NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

As shown in Table 11, localized emissions for all criteria pollutants would remain below their respective SCAQMD LSTs at 82 feet (25 meters). Therefore, construction of the Project would not result in exposure of sensitive receptors to substantial localized concentrations of criteria pollutants and precursors.

Toxic Air Contaminants

Implementation of the Project would result in the use of heavy-duty construction equipment, haul trucks, and construction worker vehicles. These vehicles and equipment could generate the TAC DPM. Generation of DPM from construction projects typically occurs in a localized area (e.g., at the Project site) for a short period of time. Because construction activities and subsequent emissions vary depending on the phase of construction (e.g., grading, building construction), the construction-related emissions to which nearby receptors are exposed to would also vary throughout the construction period. During some equipment-intensive phases such as grading, construction-related emissions would be higher than other less equipment-intensive phases such as building construction. Concentrations of mobile-source DPM emissions are typically reduced by 70 percent at approximately 500 feet (CARB 2005).

The dose (of TAC) to which receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance in the environment and the extent of exposure a person has with the substance; a longer exposure period to a fixed quantity of emissions would result in higher health risks. Current models and methodologies for conducting cancer health risk assessments are associated with longer-term exposure periods (typically 30 years for individual residents based on guidance from OEHHA) and are best suited for evaluation of long duration TAC emissions with predictable schedules and locations. These assessment models and methodologies do not correlate well with the temporary and highly variable nature of construction activities. Cancer potency factors are based on animal lifetime studies or worker studies where there is consistent long-term exposure to the carcinogenic agent. There is considerable uncertainty in trying to evaluate the cancer risk from projects that will only last a small fraction of a lifetime (OEHHA 2015). Considering this information, the highly dispersive nature of DPM, and the fact that construction activities would occur at various locations and varying intensities throughout the Project site, it is not anticipated that construction of the Project would expose sensitive receptors to substantial DPM concentrations.

5.3.1.2 Operational Activities

Once construction activity is complete, there would be no long-term emissions associated with the Project; the Project would not result in increased vehicle trips or energy demand. Therefore, operation of the Project would not result in a CO hotspot or DPM caused by a significant increase in operational vehicle trips. Operation of the Project would not generate substantial pollutant concentrations.

5.3.2 Significance of Impacts

Implementation of the Project would not expose sensitive receptors to substantial pollutant concentrations, and the impact would be less than significant.

5.3.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

5.3.4 Significance After Mitigation

Implementation of the Project would not expose sensitive receptors to substantial pollutant concentrations, and the impact would be less than significant.

5.4 ISSUE 4: OTHER EMISSIONS (SUCH AS THOSE LEADING TO ODORS)

5.4.1 Impacts

According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting activities, refineries, landfills, dairies, and fiberglass molding operations (SCAQMD 1993). The Project, involving the construction of a potable water tank, would not include any of these uses nor are there any of these land uses in the Project vicinity.

Emissions from construction equipment, such as diesel exhaust, and VOCs from architectural coatings and paving activities may generate odors; however, these odors would be temporary, intermittent, and not expected to affect a substantial number of people. Additionally, noxious odors would be confined to the immediate vicinity of construction equipment. Furthermore, short-term construction-related odors are expected to cease upon the drying or hardening of the odor-producing materials. Long-term operation of the Project would not be a substantial source of objectionable odors. Therefore, the Project would not create objectionable odors affecting a substantial number of people, and the impact would be less than significant.

5.4.2 Significance of Impacts

Implementation of the Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people, and the impact would be less than significant.

5.4.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

5.4.4 Significance After Mitigation

Implementation of the Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people, and the impact would be less than significant.

6.0 GREENHOUSE GAS IMPACT ANALYSIS

This section evaluates potential impacts of the proposed Project related to the generation of GHG emissions. Complete modeling results are included as Appendix A of this report.

6.1 ISSUE 1: GREENHOUSE GAS EMISSIONS

6.1.1 Construction Emissions

Project construction GHG emissions were estimated using the CalEEMod model as described in Section 4.1. Project-specific input was based on general information provided in Section 1.0 and default model settings to estimate reasonably conservative conditions. Additional details of phasing, selection of construction equipment, and other input parameters, including CalEEMod data, are included in Appendix A.

Emissions of GHGs related to the construction of the Project would be temporary. As shown in Table 12, *Estimated Construction Greenhouse Gas Emissions*, total GHG emissions associated with construction of the Project are estimated at 783.4 MT CO_2e. For construction emissions, Riverside County guidance recommends that the emissions be amortized (i.e., averaged) over 30 years and added to operational emissions. Averaged over 30 years, the proposed construction activities would contribute approximately 26.1 MT CO_2e emissions per year.

Table 12
ESTIMATED CONSTRUCTION GREENHOUSE GAS EMISSIONS

Year	Emissions (MT CO_2e)
2023	501.8
2024	281.6
TOTAL[1]	**783.4**
Amortized Construction Emissions[2]	*26.1*

Source: CalEEMod (output data is provided in Appendix A)
[1] Totals may not sum due to rounding.
[2] Construction emissions are amortized over 30 years in accordance with Riverside County guidance.
GHG = greenhouse gas; MT = metric tons; CO_2e = carbon dioxide equivalent

6.1.2 Operational Emissions

Once construction activity is complete, there would be no long-term emissions associated with the Project; the Project would not result in increased vehicle trips or energy demand. The Project's amortized construction emissions of 26.1 MT CO_2e emissions per year would not exceed the County of Riverside's CAP GHG screening threshold of 3,000 MT CO_2e per year.

6.1.3 Significance of Impacts

Project GHG emissions, including amortized construction emissions would not exceed the County of Riverside's CAP screening threshold, and the impact would be less than significant.

6.1.4 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

6.1.5 Significance After Mitigation

Implementation of the Project would not generate GHG emissions that may have a significant impact on the environment, and the impact would be less than significant.

6.2 ISSUE 2: CONFLICT WITH APPLICABLE PLANS ADOPTED FOR THE PURPOSE OF REDUCING GHG EMISSIONS

6.2.1 Impacts

There are numerous State plans, policies, and regulations adopted for the purpose of reducing GHG emissions. The principal overall State plan and policy is AB 32, the California Global Warming Solutions Act of 2006. The quantitative goal of AB 32 is to reduce GHG emissions to 1990 levels by 2020. SB 32 would require further reductions of 40 percent below 1990 levels by 2030. Because the Project's operational year is post-2020, the Project aims to reach the quantitative goals set by SB 32. Statewide plans and regulations such as GHG emissions standards for vehicles (AB 1493), the LCFS, and regulations requiring an increasing fraction of electricity to be generated from renewable sources are being implemented at the statewide level; as such, compliance at the project level is not addressed. Therefore, the proposed Project would not conflict with those plans and regulations.

The Project does not have a residential component and would not result in regional population growth. The Project would be consistent with the General Plan and zoning designations for the site. As shown in Section 3.3, transportation-related emissions consistently contribute the most GHG emissions in California (40 percent in 2019). The Project involves the construction of a potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure. Once construction activity is complete, there would be no long-term emissions associated with the Project; the Project would not result in increased vehicle trips or energy demand. The Project would be consistent with the local general plan and would not result in population growth or an increase in vehicle trips that would conflict with the SCAG's RTP/SCS. Additionally, as discussed under Issue 1 above, the Project would not generate GHG emissions that would conflict with the County of Riverside's CAP.

6.2.2 Significance of Impacts

The Project would not conflict with applicable GHG reduction plans including the SCAG's RTP/SCS and the County of Riverside's CAP, and the impact would be less than significant.

6.2.3 Mitigation Framework

Impacts would be less than significant, and no mitigation would be required.

6.2.4 Significance After Mitigation

The Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and the impact would be less than significant.

7.0 LIST OF PREPARERS

Kristen Garcia	Air Quality Specialist
Victor Ortiz	Senior Air Quality Specialist
Joanne Dramko, AICP	Principal Air Quality Specialist, QA/QC

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

8.0 REFERENCES

California Air Pollution Control Officers Association (CAPCOA). 2021a. Health Effects. Available At: http://www.capcoa.org/health-effects/. Accessed June 2021.

2021b. User's Guide for CalEEMod Version 2020.4.0. Available at: http://www.caleemod.com/.

California Air Resources Board (CARB). 2022. ADAM Air Quality Data Statistics: Top 4 Summary. Available at: https://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed February 2022.

2021a. Overview: Diesel Exhaust and Health. Available at: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health. Accessed October 18. 2020.

2021b. Clean Car Standards – Pavley, Assembly Bill 1493. Accessed December. Available at: http://www.arb.ca.gov/cc/ccms/ccms.htm. Accessed June 2021.

2021c. Current California GHG Emission Inventory Data. Available at: https://ww2.arb.ca.gov/ghg-inventory-data. Accessed October 2021

2017. California's 2017 Climate Change Scoping Plan. Available at: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

2016. Ambient Air Quality Standards. May 4. Available at: https://ww2.arb.ca.gov/sites/default/files/2020-03/aaqs2_0.pdf.

2014. First Update to the Climate Change Scoping Plan: Building on the Framework. Available at: http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

2009. State Implementation Plan Background. April 13. Available at: https://ww3.arb.ca.gov/planning/sip/background.htm.

2008. Climate Change Scoping Plan – A Framework for Change. December. Available at: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/document/adopted_scoping_plan.pdf.

2007. California Greenhouse Gas Inventory – By Sector and Activity. November 19. Available at: https://ww3.arb.ca.gov/cc/inventory/archive/tables/ghg_inventory_sector_sum_90-04_ar4.pdf.

2005. Air Quality and Land Use Handbook: A Community Health Perspective. April. Available at: https://ww3.arb.ca.gov/ch/handbook.pdf.

California Building Standards Commission (CBSC). 2019. CALGreen (CCR Title 24, Part 11). Available at: https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen.

California Energy Commission (CEC). 2019. CCR Title 24 Part 6, 2019 Building Energy Efficiency Standards. Available at: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency.

Intergovernmental Panel on Climate Change (IPCC). 2014. Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: https://www.ipcc.ch/report/ar5/wg3/.

2013. Climate Change 2013: The Physical Science Basis. Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: https://www.ipcc.ch/report/ar5/wg1/.

2007. Climate Change 2007: The Physical Science Basis. Summary for Policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. February. Available at: https://www.ipcc.ch/report/ar4/wg1/.

National Aeronautics and Space Administration, Goddard Institute for Space Studies (NASA). 2022. 2021 Tied for 6th Warmest Year in Continued Trend, NASA Analysis Shows. January 13. Available at: https://www.giss.nasa.gov/research/news/20220113/.

2021. NASA News & Features Releases. 2020 Tied for Warmest Year on Record, NASA Analysis Show. January 14. Available at: https://www.giss.nasa.gov/research/news/20210114/.

National Oceanic and Atmospheric Administration (NOAA). 2022. Trends in Atmospheric Carbon Dioxide. Available at: https://www.esrl.noaa.gov/gmd/ccgg/trends. Accessed February 2022.

Office of Environmental Health Hazard Assessment (OEHHA). 2015. Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February. Available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.

Riverside, County of. 2019. County of Riverside Climate Action Plan Update. November. Available at: https://planning.rctlma.org/Portals/14/CAP/2019/2019_CAP_Update_Full.pdf.

2015. County of Riverside Climate Action Plan. December. Available: http://planning.rctlma.org/Portals/0/genplan/general_plan_2016/climate_action_plan/CAP_120815.pdf?ver=2016-04-01-101221-240.

South Coast Air Quality Management District (SCAQMD). 2019. South Coast AQMD Air Quality Significance Thresholds. April. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pfdf?sfvrsn=2.

2017. Final 2016 Air Quality Management Plan. March. Available at: http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp.

2016a. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin. February. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf.

South Coast Air Quality Management District (SCAQMD) (cont.).

2016b. Rule 1113, Architectural Coatings. Amended February 5. Available at: http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf?sfvrsn=24.

2009. Mass Rate Localized Significance Thresholds Look-up Tables. October. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2.

2008. Interim GHG Significance Threshold. Available at: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds/page/2.

2005. Rule 403, Fugitive Dust. Amended June 3. Available at: http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-403.pdf?sfvrsn=4.

2001. Rule 401, Visible emissions. Amended November 9. Available at: http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-401.pdf?sfvrsn=4.

1993. *CEQA Air Quality Handbook*.

1976. Rule 402, Nuisance. Adopted May 7. Available at: http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-402.pdf?sfvrsn=4.

U.S. Environmental Protection Agency (USEPA). 2021. Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. Last updated September 10. Available at: https://www.epa.gov/ghgemissions/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a-clean.

U.S. Environmental Protection Agency (USEPA) and U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA). 2020. The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light. Corrected July 2020. Available at: https://www.govinfo.gov/content/pkg/FR-2020-04-30/pdf/2020-06967.pdf.

Weatherspark. 2022. Climate and Average Weather Year Round in Menifee. Available at: https://weatherspark.com/y/1871/Average-Weather-in-Menifee-California-United-States-Year-Round.

Western Riverside Council of Governments (WRCOG). 2014. Subregional Climate Action Plan. September. Available at: https://wrcog.us/DocumentCenter/View/188/Subregional-Climate-Action-Plan-CAP-PDF?bidId=.

World Resources Institute (WRI). 2020. CAIT Climate Data Explorer. Available: http://cait.wri.org/historical. Accessed June 2021.

This page intentionally left blank

Appendix A

CalEEMod Output

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

00678.00049.001 Quail Tank III

South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	7.85	1000sqft	5.00	7,850.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 00678.00049.001 Quail Tank III Project

Land Use - Proposed development would be an approximately 7,850 SF water tank on 5 acres of land.

Construction Phase - Construction based on defaults and info provided by applicant.

Off-road Equipment - Based on defaults and info from applicant. Off-highway trucks - haul truck, other construction equipment - water truck.

Off-road Equipment - Based on defaults and info from applicant. Other construction equipment - water truck, off-highway truck - haul truck.

Off-road Equipment - Based on defaults and info from applicant. Other construction equipment - water truck.

Off-road Equipment - Based on info from applicant and defaults.

Off-road Equipment - Based on defaults and info from applicant.

Off-road Equipment -

Grading - Based on info from applicant.

Demolition - 100 CY x 2,025 pounds (weight of broken up concrete per Google) / 2,000 = 101 tons

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Trips and VMT - info needs sheet from applicant indicates material would be hauled to a location at the project site for demolition and site prep. Haul trucks are included in the off-road equipment list and are excluded here for these two phases.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	18.00	23.00
tblConstructionPhase	NumDays	230.00	261.00
tblConstructionPhase	NumDays	8.00	41.00
tblConstructionPhase	NumDays	18.00	21.00
tblConstructionPhase	PhaseEndDate	5/14/2024	8/22/2024
tblConstructionPhase	PhaseEndDate	3/25/2024	6/22/2024
tblConstructionPhase	PhaseEndDate	5/8/2023	6/22/2023
tblConstructionPhase	PhaseEndDate	4/18/2024	7/22/2024
tblConstructionPhase	PhaseStartDate	4/19/2024	7/23/2024
tblConstructionPhase	PhaseStartDate	5/9/2023	6/23/2023
tblConstructionPhase	PhaseStartDate	3/26/2024	6/23/2024
tblGrading	MaterialExported	0.00	1,500.00
tblGrading	MaterialImported	0.00	22,636.00
tblLandUse	LotAcreage	0.18	5.00
tblOffRoadEquipment	HorsePower	172.00	189.00
tblOffRoadEquipment	HorsePower	172.00	189.00
tblOffRoadEquipment	HorsePower	172.00	189.00
tblOffRoadEquipment	LoadFactor	0.42	0.50
tblOffRoadEquipment	LoadFactor	0.42	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.42	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks

tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	10.00	0.00
tblTripsAndVMT	HaulingTripNumber	188.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.2443	2.2945	2.0324	5.5400e-003	0.3523	0.0942	0.4465	0.1667	0.0871	0.2538	0.0000	494.4934	494.4934	0.1310	0.0134	501.7608
2024	0.1846	1.1919	1.3404	3.2100e-003	6.1800e-003	0.0508	0.0569	1.6500e-003	0.0470	0.0487	0.0000	279.3948	279.3948	0.0852	2.8000e-004	281.6074
Maximum	**0.2443**	**2.2945**	**2.0324**	**5.5400e-003**	**0.3523**	**0.0942**	**0.4465**	**0.1667**	**0.0871**	**0.2538**	**0.0000**	**494.4934**	**494.4934**	**0.1310**	**0.0134**	**501.7608**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.2443	2.2945	2.0324	5.5400e-003	0.1792	0.0942	0.2735	0.0806	0.0871	0.1678	0.0000	494.4930	494.4930	0.1310	0.0134	501.7604
2024	0.1846	1.1919	1.3404	3.2100e-003	6.1800e-003	0.0508	0.0569	1.6500e-003	0.0470	0.0487	0.0000	279.3945	279.3945	0.0852	2.8000e-004	281.6071
Maximum	**0.2443**	**2.2945**	**2.0324**	**5.5400e-003**	**0.1792**	**0.0942**	**0.2735**	**0.0806**	**0.0871**	**0.1678**	**0.0000**	**494.4930**	**494.4930**	**0.1310**	**0.0134**	**501.7604**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	48.28	0.00	34.38	51.12	0.00	28.45	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-23-2023	6-22-2023	1.0837	1.0837
2	6-23-2023	9-22-2023	0.6960	0.6960
3	9-23-2023	12-22-2023	0.6885	0.6885
4	12-23-2023	3-22-2024	0.6490	0.6490
5	3-23-2024	6-22-2024	0.6517	0.6517
6	6-23-2024	9-22-2024	0.1364	0.1364
		Highest	1.0837	1.0837

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0320	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Energy	1.3700e-003	0.0124	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	27.3535	27.3535	1.4300e-003	3.9000e-004	27.5052
Mobile	0.0229	0.0305	0.2635	6.2000e-004	0.0673	4.4000e-004	0.0677	0.0180	4.1000e-004	0.0184	0.0000	57.7311	57.7311	3.4400e-003	2.4000e-003	58.5323
Waste						0.0000	0.0000		0.0000	0.0000	1.9751	0.0000	1.9751	0.1167	0.0000	4.8932
Water						0.0000	0.0000		0.0000	0.0000	0.5759	4.1920	4.7679	0.0595	1.4400e-003	6.6845
Total	**0.0563**	**0.0429**	**0.2740**	**6.9000e-004**	**0.0673**	**1.3900e-003**	**0.0687**	**0.0180**	**1.3600e-003**	**0.0193**	**2.5510**	**89.2767**	**91.8277**	**0.1811**	**4.2300e-003**	**97.6154**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0320	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Energy	1.3700e-003	0.0124	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	27.3535	27.3535	1.4300e-003	3.9000e-004	27.5052
Mobile	0.0229	0.0305	0.2635	6.2000e-004	0.0673	4.4000e-004	0.0677	0.0180	4.1000e-004	0.0184	0.0000	57.7311	57.7311	3.4400e-003	2.4000e-003	58.5323
Waste						0.0000	0.0000		0.0000	0.0000	1.9751	0.0000	1.9751	0.1167	0.0000	4.8932
Water						0.0000	0.0000		0.0000	0.0000	0.5759	4.1920	4.7679	0.0595	1.4400e-003	6.6845
Total	**0.0563**	**0.0429**	**0.2740**	**6.9000e-004**	**0.0673**	**1.3900e-003**	**0.0687**	**0.0180**	**1.3600e-003**	**0.0193**	**2.5510**	**89.2767**	**91.8277**	**0.1811**	**4.2300e-003**	**97.6154**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/23/2023	4/19/2023	5	20	
2	Site Preparation	Site Preparation	4/20/2023	4/26/2023	5	5	
3	Grading	Grading	4/27/2023	6/22/2023	5	41	

4	Building Construction	Building Construction	6/23/2023	6/22/2024	5	261	
5	Paving	Paving	6/23/2024	7/22/2024	5	21	
6	Architectural Coating	Architectural Coating	7/23/2024	8/22/2024	5	23	

Acres of Grading (Site Preparation Phase): 5

Acres of Grading (Grading Phase): 61.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 11,775; Non-Residential Outdoor: 3,925; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	1	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	2	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Demolition	Off-Highway Trucks	1	8.00	402	0.38
Demolition	Other Construction Equipment	1	8.00	189	0.50
Site Preparation	Other Construction Equipment	1	8.00	189	0.50
Site Preparation	Off-Highway Trucks	1	8.00	402	0.38
Grading	Other Construction Equipment	1	8.00	189	0.50
Building Construction	Off-Highway Trucks	2	8.00	402	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	8	20.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	8	20.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	2,830.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	10	3.00	1.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0800e-003	0.0000	1.0800e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0277	0.2505	0.2293	5.2000e-004		0.0113	0.0113		0.0105	0.0105	0.0000	45.6030	45.6030	0.0133	0.0000	45.9349
Total	**0.0277**	**0.2505**	**0.2293**	**5.2000e-004**	**1.0800e-003**	**0.0113**	**0.0124**	**1.6000e-004**	**0.0105**	**0.0106**	**0.0000**	**45.6030**	**45.6030**	**0.0133**	**0.0000**	**45.9349**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.6000e-004	6.1000e-004	8.4300e-003	3.0000e-005	2.9500e-003	2.0000e-005	2.9700e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	2.3008	2.3008	5.0000e-005	6.0000e-005	2.3187
Total	**7.6000e-004**	**6.1000e-004**	**8.4300e-003**	**3.0000e-005**	**2.9500e-003**	**2.0000e-005**	**2.9700e-003**	**7.8000e-004**	**2.0000e-005**	**8.0000e-004**	**0.0000**	**2.3008**	**2.3008**	**5.0000e-005**	**6.0000e-005**	**2.3187**

3.2 Demolition - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.9000e-004	0.0000	4.9000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0277	0.2505	0.2293	5.2000e-004		0.0113	0.0113		0.0105	0.0105	0.0000	45.6030	45.6030	0.0133	0.0000	45.9348
Total	**0.0277**	**0.2505**	**0.2293**	**5.2000e-004**	**4.9000e-004**	**0.0113**	**0.0118**	**7.0000e-005**	**0.0105**	**0.0105**	**0.0000**	**45.6030**	**45.6030**	**0.0133**	**0.0000**	**45.9348**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.6000e-004	6.1000e-004	8.4300e-003	3.0000e-005	2.9500e-003	2.0000e-005	2.9700e-003	7.8000e-004	2.0000e-005	8.0000e-004	0.0000	2.3008	2.3008	5.0000e-005	6.0000e-005	2.3187
Total	**7.6000e-004**	**6.1000e-004**	**8.4300e-003**	**3.0000e-005**	**2.9500e-003**	**2.0000e-005**	**2.9700e-003**	**7.8000e-004**	**2.0000e-005**	**8.0000e-004**	**0.0000**	**2.3008**	**2.3008**	**5.0000e-005**	**6.0000e-005**	**2.3187**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0329	0.0000	0.0329	0.0169	0.0000	0.0169	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.2000e-003	0.0600	0.0461	1.1000e-004		2.6900e-003	2.6900e-003		2.4700e-003	2.4700e-003	0.0000	9.4043	9.4043	3.0400e-003	0.0000	9.4804
Total	**6.2000e-003**	**0.0600**	**0.0461**	**1.1000e-004**	**0.0329**	**2.6900e-003**	**0.0355**	**0.0169**	**2.4700e-003**	**0.0193**	**0.0000**	**9.4043**	**9.4043**	**3.0400e-003**	**0.0000**	**9.4804**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.5000e-004	2.1100e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.5752	0.5752	1.0000e-005	1.0000e-005	0.5797
Total	**1.9000e-004**	**1.5000e-004**	**2.1100e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.4000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.5752**	**0.5752**	**1.0000e-005**	**1.0000e-005**	**0.5797**

3.3 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0148	0.0000	0.0148	7.5800e-003	0.0000	7.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.2000e-003	0.0600	0.0461	1.1000e-004		2.6900e-003	2.6900e-003		2.4700e-003	2.4700e-003	0.0000	9.4043	9.4043	3.0400e-003	0.0000	9.4804
Total	**6.2000e-003**	**0.0600**	**0.0461**	**1.1000e-004**	**0.0148**	**2.6900e-003**	**0.0175**	**7.5800e-003**	**2.4700e-003**	**0.0101**	**0.0000**	**9.4043**	**9.4043**	**3.0400e-003**	**0.0000**	**9.4804**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.5000e-004	2.1100e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.5752	0.5752	1.0000e-005	1.0000e-005	0.5797
Total	**1.9000e-004**	**1.5000e-004**	**2.1100e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.4000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.5752**	**0.5752**	**1.0000e-005**	**1.0000e-005**	**0.5797**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2808	0.0000	0.2808	0.1394	0.0000	0.1394	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0491	0.5138	0.3661	7.8000e-004		0.0225	0.0225		0.0207	0.0207	0.0000	68.8042	68.8042	0.0223	0.0000	69.3606
Total	**0.0491**	**0.5138**	**0.3661**	**7.8000e-004**	**0.2808**	**0.0225**	**0.3033**	**0.1394**	**0.0207**	**0.1601**	**0.0000**	**68.8042**	**68.8042**	**0.0223**	**0.0000**	**69.3606**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9100e-003	0.1836	0.0489	8.1000e-004	0.0243	1.2200e-003	0.0256	6.6800e-003	1.1700e-003	7.8500e-003	0.0000	81.4753	81.4753	4.9900e-003	0.0130	85.4621
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5500e-003	1.2500e-003	0.0173	5.0000e-005	6.0600e-003	3.0000e-005	6.0900e-003	1.6100e-003	3.0000e-005	1.6400e-003	0.0000	4.7166	4.7166	1.1000e-004	1.1000e-004	4.7534
Total	**4.4600e-003**	**0.1848**	**0.0662**	**8.6000e-004**	**0.0304**	**1.2500e-003**	**0.0317**	**8.2900e-003**	**1.2000e-003**	**9.4900e-003**	**0.0000**	**86.1919**	**86.1919**	**5.1000e-004**	**0.0131**	**90.2154**

3.4 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1264	0.0000	0.1264	0.0628	0.0000	0.0628	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0491	0.5138	0.3661	7.8000e-004		0.0225	0.0225		0.0207	0.0207	0.0000	68.8042	68.8042	0.0223	0.0000	69.3605
Total	**0.0491**	**0.5138**	**0.3661**	**7.8000e-004**	**0.1264**	**0.0225**	**0.1488**	**0.0628**	**0.0207**	**0.0834**	**0.0000**	**68.8042**	**68.8042**	**0.0223**	**0.0000**	**69.3605**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9100e-003	0.1836	0.0489	8.1000e-004	0.0243	1.2200e-003	0.0256	6.6800e-003	1.1700e-003	7.8500e-003	0.0000	81.4753	81.4753	4.9900e-003	0.0130	85.4621
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5500e-003	1.2500e-003	0.0173	5.0000e-005	6.0600e-003	3.0000e-005	6.0900e-003	1.6100e-003	3.0000e-005	1.6400e-003	0.0000	4.7166	4.7166	1.1000e-004	1.1000e-004	4.7534
Total	**4.4600e-003**	**0.1848**	**0.0662**	**8.6000e-004**	**0.0304**	**1.2500e-003**	**0.0317**	**8.2900e-003**	**1.2000e-003**	**9.4900e-003**	**0.0000**	**86.1919**	**86.1919**	**5.1000e-003**	**0.0131**	**90.2154**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1550	1.2812	1.3046	3.1900e-003		0.0565	0.0565		0.0523	0.0523	0.0000	277.8916	277.8916	0.0871	0.0000	280.0699
Total	**0.1550**	**1.2812**	**1.3046**	**3.1900e-003**		**0.0565**	**0.0565**		**0.0523**	**0.0523**	**0.0000**	**277.8916**	**277.8916**	**0.0871**	**0.0000**	**280.0699**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	2.8800e-003	1.0200e-003	1.0000e-005	4.9000e-004	2.0000e-005	5.1000e-004	1.4000e-004	2.0000e-005	1.6000e-004	0.0000	1.3755	1.3755	5.0000e-005	2.0000e-004	1.4362
Worker	7.7000e-004	6.2000e-004	8.6000e-003	3.0000e-005	3.0100e-003	2.0000e-005	3.0300e-003	8.0000e-004	2.0000e-005	8.2000e-004	0.0000	2.3468	2.3468	5.0000e-005	6.0000e-005	2.3651
Total	**8.5000e-004**	**3.5000e-003**	**9.6200e-003**	**4.0000e-005**	**3.5000e-003**	**4.0000e-005**	**3.5400e-003**	**9.4000e-004**	**4.0000e-005**	**9.8000e-004**	**0.0000**	**3.7223**	**3.7223**	**1.0000e-004**	**2.6000e-004**	**3.8013**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1550	1.2812	1.3046	3.1900e-003		0.0565	0.0565		0.0523	0.0523	0.0000	277.8913	277.8913	0.0871	0.0000	280.0696
Total	**0.1550**	**1.2812**	**1.3046**	**3.1900e-003**		**0.0565**	**0.0565**		**0.0523**	**0.0523**	**0.0000**	**277.8913**	**277.8913**	**0.0871**	**0.0000**	**280.0696**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	2.8800e-003	1.0200e-003	1.0000e-005	4.9000e-004	2.0000e-005	5.1000e-004	1.4000e-004	2.0000e-005	1.6000e-004	0.0000	1.3755	1.3755	5.0000e-005	2.0000e-004	1.4362
Worker	7.7000e-004	6.2000e-004	8.6000e-003	3.0000e-005	3.0100e-003	2.0000e-005	3.0300e-003	8.0000e-004	2.0000e-005	8.2000e-004	0.0000	2.3468	2.3468	5.0000e-005	6.0000e-005	2.3651
Total	**8.5000e-004**	**3.5000e-003**	**9.6200e-003**	**4.0000e-005**	**3.5000e-003**	**4.0000e-005**	**3.5400e-003**	**9.4000e-004**	**4.0000e-005**	**9.8000e-004**	**0.0000**	**3.7223**	**3.7223**	**1.0000e-004**	**2.6000e-004**	**3.8013**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1366	1.0993	1.1897	2.9400e-003		0.0465	0.0465		0.0430	0.0430	0.0000	255.4955	255.4955	0.0800	0.0000	257.4962
Total	**0.1366**	**1.0993**	**1.1897**	**2.9400e-003**		**0.0465**	**0.0465**		**0.0430**	**0.0430**	**0.0000**	**255.4955**	**255.4955**	**0.0800**	**0.0000**	**257.4962**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-005	2.6600e-003	9.2000e-004	1.0000e-005	4.5000e-004	1.0000e-005	4.7000e-004	1.3000e-004	1.0000e-005	1.4000e-004	0.0000	1.2463	1.2463	5.0000e-005	1.8000e-004	1.3014
Worker	6.6000e-004	5.1000e-004	7.3500e-003	2.0000e-005	2.7700e-003	1.0000e-005	2.7900e-003	7.4000e-004	1.0000e-005	7.5000e-004	0.0000	2.0940	2.0940	4.0000e-005	5.0000e-005	2.1095
Total	**7.3000e-004**	**3.1700e-003**	**8.2700e-003**	**3.0000e-005**	**3.2200e-003**	**2.0000e-005**	**3.2600e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**3.3403**	**3.3403**	**9.0000e-005**	**2.3000e-004**	**3.4109**

3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1366	1.0993	1.1897	2.9400e-003		0.0465	0.0465		0.0430	0.0430	0.0000	255.4952	255.4952	0.0800	0.0000	257.4959
Total	**0.1366**	**1.0993**	**1.1897**	**2.9400e-003**		**0.0465**	**0.0465**		**0.0430**	**0.0430**	**0.0000**	**255.4952**	**255.4952**	**0.0800**	**0.0000**	**257.4959**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-005	2.6600e-003	9.2000e-004	1.0000e-005	4.5000e-004	1.0000e-005	4.7000e-004	1.3000e-004	1.0000e-005	1.4000e-004	0.0000	1.2463	1.2463	5.0000e-005	1.8000e-004	1.3014
Worker	6.6000e-004	5.1000e-004	7.3500e-003	2.0000e-005	2.7700e-003	1.0000e-005	2.7900e-003	7.4000e-004	1.0000e-005	7.5000e-004	0.0000	2.0940	2.0940	4.0000e-005	5.0000e-005	2.1095
Total	**7.3000e-004**	**3.1700e-003**	**8.2700e-003**	**3.0000e-005**	**3.2200e-003**	**2.0000e-005**	**3.2600e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**3.3403**	**3.3403**	**9.0000e-005**	**2.3000e-004**	**3.4109**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.1100e-003	0.0749	0.1138	1.8000e-004		3.5500e-003	3.5500e-003		3.2800e-003	3.2800e-003	0.0000	15.3837	15.3837	4.8200e-003	0.0000	15.5041
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.1100e-003**	**0.0749**	**0.1138**	**1.8000e-004**		**3.5500e-003**	**3.5500e-003**		**3.2800e-003**	**3.2800e-003**	**0.0000**	**15.3837**	**15.3837**	**4.8200e-003**	**0.0000**	**15.5041**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	5.2000e-004	7.4100e-003	2.0000e-005	2.7900e-003	2.0000e-005	2.8100e-003	7.4000e-004	1.0000e-005	7.6000e-004	0.0000	2.1107	2.1107	4.0000e-005	5.0000e-005	2.1264
Total	**6.7000e-004**	**5.2000e-004**	**7.4100e-003**	**2.0000e-005**	**2.7900e-003**	**2.0000e-005**	**2.8100e-003**	**7.4000e-004**	**1.0000e-005**	**7.6000e-004**	**0.0000**	**2.1107**	**2.1107**	**4.0000e-005**	**5.0000e-005**	**2.1264**

3.6 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.1100e-003	0.0749	0.1138	1.8000e-004		3.5500e-003	3.5500e-003		3.2800e-003	3.2800e-003	0.0000	15.3837	15.3837	4.8200e-003	0.0000	15.5041
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.1100e-003**	**0.0749**	**0.1138**	**1.8000e-004**		**3.5500e-003**	**3.5500e-003**		**3.2800e-003**	**3.2800e-003**	**0.0000**	**15.3837**	**15.3837**	**4.8200e-003**	**0.0000**	**15.5041**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	5.2000e-004	7.4100e-003	2.0000e-005	2.7900e-003	2.0000e-005	2.8100e-003	7.4000e-004	1.0000e-005	7.6000e-004	0.0000	2.1107	2.1107	4.0000e-005	5.0000e-005	2.1264
Total	**6.7000e-004**	**5.2000e-004**	**7.4100e-003**	**2.0000e-005**	**2.7900e-003**	**2.0000e-005**	**2.8100e-003**	**7.4000e-004**	**1.0000e-005**	**7.6000e-004**	**0.0000**	**2.1107**	**2.1107**	**4.0000e-005**	**5.0000e-005**	**2.1264**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0364					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0140	0.0208	3.0000e-005		7.0000e-004	7.0000e-004		7.0000e-004	7.0000e-004	0.0000	2.9362	2.9362	1.7000e-004	0.0000	2.9404
Total	**0.0385**	**0.0140**	**0.0208**	**3.0000e-005**		**7.0000e-004**	**7.0000e-004**		**7.0000e-004**	**7.0000e-004**	**0.0000**	**2.9362**	**2.9362**	**1.7000e-004**	**0.0000**	**2.9404**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	4.5000e-004	0.0000	1.7000e-004	0.0000	1.7000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1284	0.1284	0.0000	0.0000	0.1294
Total	**4.0000e-005**	**3.0000e-005**	**4.5000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1284**	**0.1284**	**0.0000**	**0.0000**	**0.1294**

3.7 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0364					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0140	0.0208	3.0000e-005		7.0000e-004	7.0000e-004		7.0000e-004	7.0000e-004	0.0000	2.9362	2.9362	1.7000e-004	0.0000	2.9404
Total	**0.0385**	**0.0140**	**0.0208**	**3.0000e-005**		**7.0000e-004**	**7.0000e-004**		**7.0000e-004**	**7.0000e-004**	**0.0000**	**2.9362**	**2.9362**	**1.7000e-004**	**0.0000**	**2.9404**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	4.5000e-004	0.0000	1.7000e-004	0.0000	1.7000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1284	0.1284	0.0000	0.0000	0.1294
Total	**4.0000e-005**	**3.0000e-005**	**4.5000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1284**	**0.1284**	**0.0000**	**0.0000**	**0.1294**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0229	0.0305	0.2635	6.2000e-004	0.0673	4.4000e-004	0.0677	0.0180	4.1000e-004	0.0184	0.0000	57.7311	57.7311	3.4400e-003	2.4000e-003	58.5323
Unmitigated	0.0229	0.0305	0.2635	6.2000e-004	0.0673	4.4000e-004	0.0677	0.0180	4.1000e-004	0.0184	0.0000	57.7311	57.7311	3.4400e-003	2.4000e-003	58.5323

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	38.94	15.62	39.25	178,767	178,767
Total	38.94	15.62	39.25	178,767	178,767

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	18.50	10.10	7.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.543401	0.061496	0.184986	0.128935	0.023820	0.006437	0.011961	0.008652	0.000812	0.000508	0.024540	0.000745	0.003706

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	13.8103	13.8103	1.1700e-003	1.4000e-004	13.8815
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	13.8103	13.8103	1.1700e-003	1.4000e-004	13.8815
NaturalGas Mitigated	1.3700e-003	0.0124	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.5432	13.5432	2.6000e-004	2.5000e-004	13.6237
NaturalGas Unmitigated	1.3700e-003	0.0124	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.5432	13.5432	2.6000e-004	2.5000e-004	13.6237

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	253791	1.3700e-003	0.0124	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.5432	13.5432	2.6000e-004	2.5000e-004	13.6237
Total		**1.3700e-003**	**0.0124**	**0.0105**	**7.0000e-005**		**9.5000e-004**	**9.5000e-004**		**9.5000e-004**	**9.5000e-004**	**0.0000**	**13.5432**	**13.5432**	**2.6000e-004**	**2.5000e-004**	**13.6237**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	253791	1.3700e-003	0.0124	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.5432	13.5432	2.6000e-004	2.5000e-004	13.6237
Total		**1.3700e-003**	**0.0124**	**0.0105**	**7.0000e-005**		**9.5000e-004**	**9.5000e-004**		**9.5000e-004**	**9.5000e-004**	**0.0000**	**13.5432**	**13.5432**	**2.6000e-004**	**2.5000e-004**	**13.6237**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	77872	13.8103	1.1700e-003	1.4000e-004	13.8815
Total		**13.8103**	**1.1700e-003**	**1.4000e-004**	**13.8815**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	77872	13.8103	1.1700e-003	1.4000e-004	13.8815
Total		**13.8103**	**1.1700e-003**	**1.4000e-004**	**13.8815**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0320	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Unmitigated	0.0320	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.6400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0284					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Total	**0.0320**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.9000e-004**	**1.9000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.6400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0284					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Total	**0.0320**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.9000e-004**	**1.9000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	4.7679	0.0595	1.4400e-003	6.6845
Unmitigated	4.7679	0.0595	1.4400e-003	6.6845

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	1.81531 / 0	4.7679	0.0595	1.4400e-003	6.6845
Total		**4.7679**	**0.0595**	**1.4400e-003**	**6.6845**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	1.81531 / 0	4.7679	0.0595	1.4400e-003	6.6845
Total		**4.7679**	**0.0595**	**1.4400e-003**	**6.6845**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.9751	0.1167	0.0000	4.8932
Unmitigated	1.9751	0.1167	0.0000	4.8932

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	9.73	1.9751	0.1167	0.0000	4.8932
Total		**1.9751**	**0.1167**	**0.0000**	**4.8932**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	9.73	1.9751	0.1167	0.0000	4.8932
Total		**1.9751**	**0.1167**	**0.0000**	**4.8932**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

00678.00049.001 Quail Tank III

South Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	7.85	1000sqft	5.00	7,850.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 00678.00049.001 Quail Tank III Project

Land Use - Proposed development would be an approximately 7,850 SF water tank on 5 acres of land.

Construction Phase - Construction based on defaults and info provided by applicant.

Off-road Equipment - Based on defaults and info from applicant. Off-highway trucks - haul truck, other construction equipment - water truck.

Off-road Equipment - Based on defaults and info from applicant. Other construction equipment - water truck, off-highway truck - haul truck.

Off-road Equipment - Based on defaults and info from applicant. Other construction equipment - water truck.

Off-road Equipment - Based on info from applicant and defaults.

Off-road Equipment - Based on defaults and info from applicant.

Off-road Equipment -

Grading - Based on info from applicant.

Demolition - 100 CY x 2,025 pounds (weight of broken up concrete per Google) / 2,000 = 101 tons

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Trips and VMT - info needs sheet from applicant indicates material would be hauled to a location at the project site for demolition and site prep. Haul trucks are included in the off-road equipment list and are excluded here for these two phases.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	18.00	23.00
tblConstructionPhase	NumDays	230.00	261.00
tblConstructionPhase	NumDays	8.00	41.00
tblConstructionPhase	NumDays	18.00	21.00
tblConstructionPhase	PhaseEndDate	5/14/2024	8/22/2024
tblConstructionPhase	PhaseEndDate	3/25/2024	6/22/2024
tblConstructionPhase	PhaseEndDate	5/8/2023	6/22/2023
tblConstructionPhase	PhaseEndDate	4/18/2024	7/22/2024
tblConstructionPhase	PhaseStartDate	4/19/2024	7/23/2024
tblConstructionPhase	PhaseStartDate	5/9/2023	6/23/2023
tblConstructionPhase	PhaseStartDate	3/26/2024	6/23/2024
tblGrading	MaterialExported	0.00	1,500.00
tblGrading	MaterialImported	0.00	22,636.00
tblLandUse	LotAcreage	0.18	5.00
tblOffRoadEquipment	HorsePower	172.00	189.00
tblOffRoadEquipment	HorsePower	172.00	189.00
tblOffRoadEquipment	HorsePower	172.00	189.00
tblOffRoadEquipment	LoadFactor	0.42	0.50
tblOffRoadEquipment	LoadFactor	0.42	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.42	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks

tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	10.00	0.00
tblTripsAndVMT	HaulingTripNumber	188.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	2.8556	34.0020	23.7523	0.0804	15.2053	1.1573	16.3625	7.2123	1.0669	8.2791	0.0000	8,333.4061	8,333.4061	1.4705	0.7033	8,579.7482
2024	3.3485	17.6386	19.1654	0.0475	0.2709	0.7439	0.7964	0.0719	0.6882	0.7023	0.0000	4,564.5839	4,564.5839	1.4131	5.0400e-003	4,601.1130
Maximum	**3.3485**	**34.0020**	**23.7523**	**0.0804**	**15.2053**	**1.1573**	**16.3625**	**7.2123**	**1.0669**	**8.2791**	**0.0000**	**8,333.4061**	**8,333.4061**	**1.4705**	**0.7033**	**8,579.7482**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	2.8556	34.0020	23.7523	0.0804	7.6717	1.1573	8.8290	3.4714	1.0669	4.5382	0.0000	8,333.4061	8,333.4061	1.4705	0.7033	8,579.7482
2024	3.3485	17.6386	19.1654	0.0475	0.2709	0.7439	0.7964	0.0719	0.6882	0.7023	0.0000	4,564.5839	4,564.5839	1.4131	5.0400e-003	4,601.1130
Maximum	**3.3485**	**34.0020**	**23.7523**	**0.0804**	**7.6717**	**1.1573**	**8.8290**	**3.4714**	**1.0669**	**4.5382**	**0.0000**	**8,333.4061**	**8,333.4061**	**1.4705**	**0.7033**	**8,579.7482**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	48.68	0.00	43.90	51.36	0.00	41.65	0.00	0.00	0.00	0.00	0.00	0.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1754	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Energy	7.5000e-003	0.0682	0.0573	4.1000e-004		5.1800e-003	5.1800e-003		5.1800e-003	5.1800e-003		81.8019	81.8019	1.5700e-003	1.5000e-003	82.2880
Mobile	0.1405	0.1813	1.5739	3.7400e-003	0.4147	2.6900e-003	0.4174	0.1105	2.5000e-003	0.1130		381.1536	381.1536	0.0230	0.0159	386.4579
Total	**0.3235**	**0.2495**	**1.6320**	**4.1500e-003**	**0.4147**	**7.8700e-003**	**0.4225**	**0.1105**	**7.6800e-003**	**0.1182**		**462.9572**	**462.9572**	**0.0246**	**0.0174**	**468.7478**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1754	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Energy	7.5000e-003	0.0682	0.0573	4.1000e-004		5.1800e-003	5.1800e-003		5.1800e-003	5.1800e-003		81.8019	81.8019	1.5700e-003	1.5000e-003	82.2880
Mobile	0.1405	0.1813	1.5739	3.7400e-003	0.4147	2.6900e-003	0.4174	0.1105	2.5000e-003	0.1130		381.1536	381.1536	0.0230	0.0159	386.4579
Total	**0.3235**	**0.2495**	**1.6320**	**4.1500e-003**	**0.4147**	**7.8700e-003**	**0.4225**	**0.1105**	**7.6800e-003**	**0.1182**		**462.9572**	**462.9572**	**0.0246**	**0.0174**	**468.7478**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/23/2023	4/19/2023	5	20	
2	Site Preparation	Site Preparation	4/20/2023	4/26/2023	5	5	
3	Grading	Grading	4/27/2023	6/22/2023	5	41	
4	Building Construction	Building Construction	6/23/2023	6/22/2024	5	261	
5	Paving	Paving	6/23/2024	7/22/2024	5	21	
6	Architectural Coating	Architectural Coating	7/23/2024	8/22/2024	5	23	

Acres of Grading (Site Preparation Phase): 5

Acres of Grading (Grading Phase): 61.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 11,775; Non-Residential Outdoor: 3,925; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38

Grading	Excavators		1	8.00	158	0.38
Building Construction	Forklifts		3	8.00	89	0.20
Grading	Graders		1	8.00	187	0.41
Paving	Pavers		1	8.00	130	0.42
Paving	Paving Equipment		2	6.00	132	0.36
Paving	Rollers		1	6.00	80	0.38
Demolition	Rubber Tired Dozers		2	8.00	247	0.40
Grading	Rubber Tired Dozers		2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers		2	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes		3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes		3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes		1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes		4	8.00	97	0.37
Building Construction	Welders		1	8.00	46	0.45
Demolition	Off-Highway Trucks		1	8.00	402	0.38
Demolition	Other Construction Equipment		1	8.00	189	0.50
Site Preparation	Other Construction Equipment		1	8.00	189	0.50
Site Preparation	Off-Highway Trucks		1	8.00	402	0.38
Grading	Other Construction Equipment		1	8.00	189	0.50
Building Construction	Off-Highway Trucks		2	8.00	402	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	8	20.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	8	20.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	2,830.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	10	3.00	1.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Paving	7	18.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1081	0.0000	0.1081	0.0164	0.0000	0.0164			0.0000			0.0000
Off-Road	2.7730	25.0523	22.9318	0.0521		1.1265	1.1265		1.0467	1.0467		5,026.8725	5,026.8725	1.4633		5,063.4553
Total	**2.7730**	**25.0523**	**22.9318**	**0.0521**	**0.1081**	**1.1265**	**1.2346**	**0.0164**	**1.0467**	**1.0630**		**5,026.8725**	**5,026.8725**	**1.4633**		**5,063.4553**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0826	0.0597	0.8205	2.4700e-003	0.3010	1.6600e-003	0.3027	0.0798	1.5300e-003	0.0814		250.0706	250.0706	5.7000e-003	6.0300e-003	252.0108
Total	**0.0826**	**0.0597**	**0.8205**	**2.4700e-003**	**0.3010**	**1.6600e-003**	**0.3027**	**0.0798**	**1.5300e-003**	**0.0814**		**250.0706**	**250.0706**	**5.7000e-003**	**6.0300e-003**	**252.0108**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0486	0.0000	0.0486	7.3600e-003	0.0000	7.3600e-003			0.0000			0.0000
Off-Road	2.7730	25.0523	22.9318	0.0521		1.1265	1.1265		1.0467	1.0467	0.0000	5,026.8725	5,026.8725	1.4633		5,063.4553
Total	**2.7730**	**25.0523**	**22.9318**	**0.0521**	**0.0486**	**1.1265**	**1.1752**	**7.3600e-003**	**1.0467**	**1.0540**	**0.0000**	**5,026.8725**	**5,026.8725**	**1.4633**		**5,063.4553**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0826	0.0597	0.8205	2.4700e-003	0.3010	1.6600e-003	0.3027	0.0798	1.5300e-003	0.0814		250.0706	250.0706	5.7000e-003	6.0300e-003	252.0108
Total	**0.0826**	**0.0597**	**0.8205**	**2.4700e-003**	**0.3010**	**1.6600e-003**	**0.3027**	**0.0798**	**1.5300e-003**	**0.0814**		**250.0706**	**250.0706**	**5.7000e-003**	**6.0300e-003**	**252.0108**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.1386	0.0000	13.1386	6.7401	0.0000	6.7401			0.0000			0.0000
Off-Road	2.4812	23.9828	18.4429	0.0428		1.0748	1.0748		0.9888	0.9888		4,146.595 3	4,146.595 3	1.3411		4,180.122 7
Total	**2.4812**	**23.9828**	**18.4429**	**0.0428**	**13.1386**	**1.0748**	**14.2134**	**6.7401**	**0.9888**	**7.7289**		**4,146.595 3**	**4,146.595 3**	**1.3411**		**4,180.122 7**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0826	0.0597	0.8205	2.4700e-003	0.3010	1.6600e-003	0.3027	0.0798	1.5300e-003	0.0814		250.0706	250.0706	5.7000e-003	6.0300e-003	252.0108
Total	**0.0826**	**0.0597**	**0.8205**	**2.4700e-003**	**0.3010**	**1.6600e-003**	**0.3027**	**0.0798**	**1.5300e-003**	**0.0814**		**250.0706**	**250.0706**	**5.7000e-003**	**6.0300e-003**	**252.0108**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.9124	0.0000	5.9124	3.0331	0.0000	3.0331			0.0000			0.0000
Off-Road	2.4812	23.9828	18.4429	0.0428		1.0748	1.0748		0.9888	0.9888	0.0000	4,146.5953	4,146.5953	1.3411		4,180.1227
Total	**2.4812**	**23.9828**	**18.4429**	**0.0428**	**5.9124**	**1.0748**	**6.9871**	**3.0331**	**0.9888**	**4.0218**	**0.0000**	**4,146.5953**	**4,146.5953**	**1.3411**		**4,180.1227**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0826	0.0597	0.8205	2.4700e-003	0.3010	1.6600e-003	0.3027	0.0798	1.5300e-003	0.0814		250.0706	250.0706	5.7000e-003	6.0300e-003	252.0108
Total	**0.0826**	**0.0597**	**0.8205**	**2.4700e-003**	**0.3010**	**1.6600e-003**	**0.3027**	**0.0798**	**1.5300e-003**	**0.0814**		**250.0706**	**250.0706**	**5.7000e-003**	**6.0300e-003**	**252.0108**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.6974	0.0000	13.6974	6.8017	0.0000	6.8017			0.0000			0.0000
Off-Road	2.3956	25.0630	17.8570	0.0382		1.0958	1.0958		1.0082	1.0082		3,699.6917	3,699.6917	1.1966		3,729.6056
Total	**2.3956**	**25.0630**	**17.8570**	**0.0382**	**13.6974**	**1.0958**	**14.7932**	**6.8017**	**1.0082**	**7.8099**		**3,699.6917**	**3,699.6917**	**1.1966**		**3,729.6056**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1364	8.8793	2.4046	0.0397	1.2069	0.0597	1.2666	0.3308	0.0572	0.3879		4,383.643 8	4,383.643 8	0.2683	0.6973	4,598.131 8
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0826	0.0597	0.8205	2.4700e-003	0.3010	1.6600e-003	0.3027	0.0798	1.5300e-003	0.0814		250.0706	250.0706	5.7000e-003	6.0300e-003	252.0108
Total	**0.2190**	**8.9390**	**3.2250**	**0.0422**	**1.5079**	**0.0614**	**1.5693**	**0.4106**	**0.0587**	**0.4693**		**4,633.714 4**	**4,633.714 4**	**0.2740**	**0.7033**	**4,850.142 6**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1638	0.0000	6.1638	3.0608	0.0000	3.0608			0.0000			0.0000
Off-Road	2.3956	25.0630	17.8570	0.0382		1.0958	1.0958		1.0082	1.0082	0.0000	3,699.691 7	3,699.691 7	1.1966		3,729.605 6
Total	**2.3956**	**25.0630**	**17.8570**	**0.0382**	**6.1638**	**1.0958**	**7.2597**	**3.0608**	**1.0082**	**4.0689**	**0.0000**	**3,699.691 7**	**3,699.691 7**	**1.1966**		**3,729.605 6**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1364	8.8793	2.4046	0.0397	1.2069	0.0597	1.2666	0.3308	0.0572	0.3879		4,383.6438	4,383.6438	0.2683	0.6973	4,598.1318
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0826	0.0597	0.8205	2.4700e-003	0.3010	1.6600e-003	0.3027	0.0798	1.5300e-003	0.0814		250.0706	250.0706	5.7000e-003	6.0300e-003	252.0108
Total	**0.2190**	**8.9390**	**3.2250**	**0.0422**	**1.5079**	**0.0614**	**1.5693**	**0.4106**	**0.0587**	**0.4693**		**4,633.7144**	**4,633.7144**	**0.2740**	**0.7033**	**4,850.1426**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2797	18.8408	19.1845	0.0470		0.8308	0.8308		0.7687	0.7687		4,504.7512	4,504.7512	1.4125		4,540.0628
Total	**2.2797**	**18.8408**	**19.1845**	**0.0470**		**0.8308**	**0.8308**		**0.7687**	**0.7687**		**4,504.7512**	**4,504.7512**	**1.4125**		**4,540.0628**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-003	0.0422	0.0152	2.1000e-004	7.3300e-003	2.3000e-004	7.5600e-003	2.1100e-003	2.2000e-004	2.3300e-003		22.3166	22.3166	8.2000e-004	3.2400e-003	23.3015
Worker	0.0124	8.9500e-003	0.1231	3.7000e-004	0.0452	2.5000e-004	0.0454	0.0120	2.3000e-004	0.0122		37.5106	37.5106	8.5000e-004	9.0000e-004	37.8016
Total	**0.0135**	**0.0511**	**0.1383**	**5.8000e-004**	**0.0525**	**4.8000e-004**	**0.0530**	**0.0141**	**4.5000e-004**	**0.0145**		**59.8272**	**59.8272**	**1.6700e-003**	**4.1400e-003**	**61.1031**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2797	18.8408	19.1845	0.0470		0.8308	0.8308		0.7687	0.7687	0.0000	4,504.7512	4,504.7512	1.4125		4,540.0628
Total	**2.2797**	**18.8408**	**19.1845**	**0.0470**		**0.8308**	**0.8308**		**0.7687**	**0.7687**	**0.0000**	**4,504.7512**	**4,504.7512**	**1.4125**		**4,540.0628**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-003	0.0422	0.0152	2.1000e-004	7.3300e-003	2.3000e-004	7.5600e-003	2.1100e-003	2.2000e-004	2.3300e-003		22.3166	22.3166	8.2000e-004	3.2400e-003	23.3015
Worker	0.0124	8.9500e-003	0.1231	3.7000e-004	0.0452	2.5000e-004	0.0454	0.0120	2.3000e-004	0.0122		37.5106	37.5106	8.5000e-004	9.0000e-004	37.8016
Total	**0.0135**	**0.0511**	**0.1383**	**5.8000e-004**	**0.0525**	**4.8000e-004**	**0.0530**	**0.0141**	**4.5000e-004**	**0.0145**		**59.8272**	**59.8272**	**1.6700e-003**	**4.1400e-003**	**61.1031**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1855	17.5882	19.0359	0.0470		0.7434	0.7434		0.6877	0.6877		4,506.1687	4,506.1687	1.4115		4,541.4552
Total	**2.1855**	**17.5882**	**19.0359**	**0.0470**		**0.7434**	**0.7434**		**0.6877**	**0.6877**		**4,506.1687**	**4,506.1687**	**1.4115**		**4,541.4552**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0700e-003	0.0424	0.0150	2.0000e-004	7.3300e-003	2.3000e-004	7.5600e-003	2.1100e-003	2.2000e-004	2.3300e-003		21.9999	21.9999	8.2000e-004	3.2000e-003	22.9726
Worker	0.0116	7.9700e-003	0.1145	3.6000e-004	0.0452	2.4000e-004	0.0454	0.0120	2.2000e-004	0.0122		36.4154	36.4154	7.7000e-004	8.4000e-004	36.6853
Total	**0.0127**	**0.0503**	**0.1295**	**5.6000e-004**	**0.0525**	**4.7000e-004**	**0.0530**	**0.0141**	**4.4000e-004**	**0.0145**		**58.4152**	**58.4152**	**1.5900e-003**	**4.0400e-003**	**59.6578**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1855	17.5882	19.0359	0.0470		0.7434	0.7434		0.6877	0.6877	0.0000	4,506.1687	4,506.1687	1.4115		4,541.4552
Total	**2.1855**	**17.5882**	**19.0359**	**0.0470**		**0.7434**	**0.7434**		**0.6877**	**0.6877**	**0.0000**	**4,506.1687**	**4,506.1687**	**1.4115**		**4,541.4552**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0700e-003	0.0424	0.0150	2.0000e-004	7.3300e-003	2.3000e-004	7.5600e-003	2.1100e-003	2.2000e-004	2.3300e-003		21.9999	21.9999	8.2000e-004	3.2000e-003	22.9726
Worker	0.0116	7.9700e-003	0.1145	3.6000e-004	0.0452	2.4000e-004	0.0454	0.0120	2.2000e-004	0.0122		36.4154	36.4154	7.7000e-004	8.4000e-004	36.6853
Total	**0.0127**	**0.0503**	**0.1295**	**5.6000e-004**	**0.0525**	**4.7000e-004**	**0.0530**	**0.0141**	**4.4000e-004**	**0.0145**		**58.4152**	**58.4152**	**1.5900e-003**	**4.0400e-003**	**59.6578**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7721	7.1298	10.8334	0.0170		0.3382	0.3382		0.3128	0.3128		1,615.0112	1,615.0112	0.5057		1,627.6534
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7721**	**7.1298**	**10.8334**	**0.0170**		**0.3382**	**0.3382**		**0.3128**	**0.3128**		**1,615.0112**	**1,615.0112**	**0.5057**		**1,627.6534**

3.6 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0697	0.0479	0.6868	2.1600e-003	0.2709	1.4300e-003	0.2724	0.0719	1.3200e-003	0.0732		218.4922	218.4922	4.6400e-003	5.0400e-003	220.1115
Total	**0.0697**	**0.0479**	**0.6868**	**2.1600e-003**	**0.2709**	**1.4300e-003**	**0.2724**	**0.0719**	**1.3200e-003**	**0.0732**		**218.4922**	**218.4922**	**4.6400e-003**	**5.0400e-003**	**220.1115**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7721	7.1298	10.8334	0.0170		0.3382	0.3382		0.3128	0.3128	0.0000	1,615.0112	1,615.0112	0.5057		1,627.6534
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7721**	**7.1298**	**10.8334**	**0.0170**		**0.3382**	**0.3382**		**0.3128**	**0.3128**	**0.0000**	**1,615.0112**	**1,615.0112**	**0.5057**		**1,627.6534**

3.6 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0697	0.0479	0.6868	2.1600e-003	0.2709	1.4300e-003	0.2724	0.0719	1.3200e-003	0.0732		218.4922	218.4922	4.6400e-003	5.0400e-003	220.1115
Total	**0.0697**	**0.0479**	**0.6868**	**2.1600e-003**	**0.2709**	**1.4300e-003**	**0.2724**	**0.0719**	**1.3200e-003**	**0.0732**		**218.4922**	**218.4922**	**4.6400e-003**	**5.0400e-003**	**220.1115**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.1639					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.8443
Total	**3.3447**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.8443**

3.7 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8700e-003	2.6600e-003	0.0382	1.2000e-004	0.0151	8.0000e-005	0.0151	3.9900e-003	7.0000e-005	4.0600e-003		12.1385	12.1385	2.6000e-004	2.8000e-004	12.2284
Total	**3.8700e-003**	**2.6600e-003**	**0.0382**	**1.2000e-004**	**0.0151**	**8.0000e-005**	**0.0151**	**3.9900e-003**	**7.0000e-005**	**4.0600e-003**		**12.1385**	**12.1385**	**2.6000e-004**	**2.8000e-004**	**12.2284**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.1639					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.8443
Total	**3.3447**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.8443**

3.7 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8700e-003	2.6600e-003	0.0382	1.2000e-004	0.0151	8.0000e-005	0.0151	3.9900e-003	7.0000e-005	4.0600e-003		12.1385	12.1385	2.6000e-004	2.8000e-004	12.2284
Total	**3.8700e-003**	**2.6600e-003**	**0.0382**	**1.2000e-004**	**0.0151**	**8.0000e-005**	**0.0151**	**3.9900e-003**	**7.0000e-005**	**4.0600e-003**		**12.1385**	**12.1385**	**2.6000e-004**	**2.8000e-004**	**12.2284**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1405	0.1813	1.5739	3.7400e-003	0.4147	2.6900e-003	0.4174	0.1105	2.5000e-003	0.1130		381.1536	381.1536	0.0230	0.0159	386.4579
Unmitigated	0.1405	0.1813	1.5739	3.7400e-003	0.4147	2.6900e-003	0.4174	0.1105	2.5000e-003	0.1130		381.1536	381.1536	0.0230	0.0159	386.4579

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	38.94	15.62	39.25	178,767	178,767
Total	38.94	15.62	39.25	178,767	178,767

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	18.50	10.10	7.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.543401	0.061496	0.184986	0.128935	0.023820	0.006437	0.011961	0.008652	0.000812	0.000508	0.024540	0.000745	0.003706

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	7.5000e-003	0.0682	0.0573	4.1000e-004		5.1800e-003	5.1800e-003		5.1800e-003	5.1800e-003		81.8019	81.8019	1.5700e-003	1.5000e-003	82.2880
NaturalGas Unmitigated	7.5000e-003	0.0682	0.0573	4.1000e-004		5.1800e-003	5.1800e-003		5.1800e-003	5.1800e-003		81.8019	81.8019	1.5700e-003	1.5000e-003	82.2880

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	695.316	7.5000e-003	0.0682	0.0573	4.1000e-004		5.1800e-003	5.1800e-003		5.1800e-003	5.1800e-003		81.8019	81.8019	1.5700e-003	1.5000e-003	82.2880
Total		**7.5000e-003**	**0.0682**	**0.0573**	**4.1000e-004**		**5.1800e-003**	**5.1800e-003**		**5.1800e-003**	**5.1800e-003**		**81.8019**	**81.8019**	**1.5700e-003**	**1.5000e-003**	**82.2880**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0.695316	7.5000e-003	0.0682	0.0573	4.1000e-004		5.1800e-003	5.1800e-003		5.1800e-003	5.1800e-003		81.8019	81.8019	1.5700e-003	1.5000e-003	82.2880
Total		**7.5000e-003**	**0.0682**	**0.0573**	**4.1000e-004**		**5.1800e-003**	**5.1800e-003**		**5.1800e-003**	**5.1800e-003**		**81.8019**	**81.8019**	**1.5700e-003**	**1.5000e-003**	**82.2880**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1754	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Unmitigated	0.1754	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0199					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1554					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Total	**0.1754**	**1.0000e-005**	**8.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7200e-003**	**1.7200e-003**	**0.0000**		**1.8300e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0199					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1554					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Total	**0.1754**	**1.0000e-005**	**8.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7200e-003**	**1.7200e-003**	**0.0000**		**1.8300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

IS/MND Appendix B

General Biological Resource Assessment Report

Quail Valley Regional Water Tank III Project

General Biological Resources Assessment and Western Riverside County Multiple Species Habitat Conservation Plan Consistency Analysis

August 2022 | 00678.00049.001

Prepared for:

Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92570

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

This page intentionally left blank

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

Section **Page**

TABLE OF CONTENTS (cont.)

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

TABLE OF CONTENTS (cont.)

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

APN	Assessor's Parcel Number
BMP	best management practice
BUOW	burrowing owl
CAGN	coastal California gnatcatcher
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFG	California Fish and Game
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
County	County of Riverside
CWA	Clean Water Act
DBESP	Determination of Biologically Equivalent or Superior Preservation
Dudek	Dudek & Associates
EMWD	Eastern Municipal Water District
GBRA	General Biological Resources Assessment
HELIX	HELIX Environmental Planning, Inc.
LDMF	Local Development Mitigation Fee
MBTA	Migratory Bird Treaty Act
MCV	Manual of California Vegetation
MSHCP	Multiple Species Habitat Conservation Plan
NEPSSA	Narrow Endemic Plant Species Survey Area
NPPA	Native Plant Protection Act
OHWM	Ordinary High Water Mark
Project	Glen Ivy Senior Community
PQP	public quasi-public
PSE	Participating Special Entity
RCA	Western Riverside County Regional Conservation Authority
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SKRHCP	Stephens' Kangaroo Rat Habitat Conservation Plan

ACRONYMS AND ABBREVIATIONS (cont.)

USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
UWIG	Urban/Wildlands Interface Guidelines

Report Date:	August 18, 2022
Title:	General Biological Resources Assessment (GBRA) and Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) Consistency Analysis for the Quail Valley Regional Water Tank III Project
Project Location:	The approximately 5.09-acre Study Area is located east of Goetz Road, northeast of Canyon Lake in the City of Menifee, Riverside County, California. Specifically, the Study Area is located approximately 2.5 miles west of Interstate 215 in Township 5 South, Range 3 West, Section 30 on the U.S. Geological Survey (USGS) 7.5-minute Romoland quadrangle.
Assessor's Parcel Numbers:	341-050-006 and a portion of 341-050-007
Owner/Applicant:	Eastern Municipal Water District 2270 Trumble Rd. Perris, California 92570
Principal Investigator:	HELIX Environmental Planning, Inc. 7578 El Cajon Blvd. La Mesa, CA 91942 (619) 462-1515
Report Summary:	The purpose of this report is to summarize the findings of a biological resource technical study and analyze Project impacts in light of the California Environmental Quality Act (CEQA) and Western Riverside Multiple Species Habitat Conservation Plan (MSHCP). The approximately 5.09 acre Study Area was surveyed for burrowing owl (*Athene cunicularia*), MSHCP Riparian/Riverine and Vernal Pool resources, sensitive plants, coastal California gnatcatcher, and jurisdictional aquatic resources. No burrowing owls, vernal pools, or sensitive plants were observed on the Study Area. The coastal California gnatcatcher, an MSHCP covered species, and a single riverine feature, were observed.
Report Preparers:	Robert Hogenauer (562) 537-2426 Amy Mila de la Roca (619) 462-1515 Karl Osmundson (619) 462-1515
Field Personnel:	Robert Hogenauer (562) 537-2426 Garrett Huffman (623) 238-1545

EXECUTIVE SUMMARY

The Quail Valley Regional Water Tank III (Project) is located within the Sun City/Menifee Valley Area Plan of the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) but is not with a criteria cell or subunit. Proposed or existing MSHCP Cores and Linkages do not occur within the Study Area. The Project proponent, Eastern Municipal Water District (District), is not a signatory to the MSHCP, but is seeking coverage under the MSHCP as a Participating Special Entity (PSE). Surveys conducted within the Study Area include an aquatic resource delineation, Riparian/Riverine and Vernal Pool habitat assessment, rare plant surveys, burrowing owl (BUOW) survey, and a coastal California gnatcatcher (*Polioptila californica californica*; CAGN) survey. A small ephemeral drainage crosses the property that meets the definition of an MSHCP Section 6.1.2 Riparian/Riverine feature, but no MSHCP Riparian/Riverine species were observed. The proposed tank Project will result in impacts to ephemeral drain, and CAGN foraging habitat.

The Project would result in 1.34 acres of total impacts to Riversidean sage scrub (including disturbed) habitat determined to be occupied by CAGN and/or occurs immediately adjacent to occupied habitat, which is an MSHCP covered species. The District is seeking MSHCP take coverage for impacts to occupied CAGN habitat through the PSE process. Off-site impacts will occur to 0.063 acre disturbed habitat (i.e., ruderal/weedy areas and bare earth) and 0.008 acre of Riversidean sage scrub as a result of grading activities along South Canyon Drive. The Project will result in 0.21 acre of temporary impacts to vegetation communities. The Project would also result in 0.01 acre of impacts to non-wetland waters of the U.S. regulated by the U.S. Army Corps of Engineers (USACE) pursuant to Clean Water Act (CWA) Section 404, 0.042 acre of impacts to non-wetland waters of the State regulated by the Regional Water Quality Control Board (RWQCB) pursuant to CWA Section 401, 0.042 acre of impacts to streambed regulated by the California Department of Fish and Wildlife (CDFW) pursuant to California Fish and Game (CFG) Code Sections 1600 et seq., and 0.042 acre of riverine resources regulated under MSHCP Section 6.1.2. Although the project would not impact the entire 0.048 acre on-site riparian/riverine resource, mitigation is proposed for the full 0.048 acre since long-term conservation would not be established for the remaining 0.006 acre. Mitigation is proposed to occur at a 2:1 ratio via the purchase of credits at the Riverpark Mitigation Bank or alternative method approved by USACE, RWQCB, and CDFW.

This page intentionally left blank

1.0 INTRODUCTION

This report describes the results of a general biological resources assessment (GBRA) study conducted by HELIX Environmental Planning, Inc. (HELIX) for the proposed Eastern Municipal Water District (District) Quail Valley Water Tank III Project (Project), which generally includes the construction and operation of a third water tank at the location of the existing facility. The Project also includes a detention basin and additional components to connect the facility to the existing infrastructure. The purpose of this report is to document the existing biological conditions within an approximately 5.09-acre Study Area and provide an analysis of potential impacts on sensitive biological resources with respect to local, state, and federal policy. Although the District is not a signatory of the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) they are seeking MSHCP coverage as a Participating Special Entity (PSE) in accordance with Section 11.8 of the MSCHP Participating Agreement. Specifically, the Project would result in unavoidable impacts on Riversidean sage scrub habitat occupied by the federally threatened coastal California gnatcatcher (*Polioptila californica californica*; CAGN), which is a covered species under the MSHCP.

The purpose of this report is (1) to document the results of a biological resource technical study, and (2) analyze the potential impacts of the Project pursuant to the requirement of the adopted MSHCP (Dudek and Associates [Dudek] 2003), and the California Environmental Quality Act (CEQA). The District is the CEQA lead agency for the Project, with the RCA being the entity to review MSHCP consistency.

1.1 PROJECT AREA

The proposed Project is generally north and east of Canyon Lake, south of Highway 74, and approximately 2.5 miles west of Interstate 215 in the City of Menifee (City), Riverside County (County), California (Figure 1, *Regional Location*). The Study Area for the Project encompasses Assessor's Parcel Number (APN) 341-050-006, in addition to portions of APN 341-050-006 and the South Canyon Drive public right-of-way (ROW). The Study Area is located in Township 5 South, Range 3 West, Section 30 on the U.S. Geological Survey (USGS) 7.5-minute Romoland quadrangle (Figures 2 and 3, *USGS Topography* and *Aerial Photograph*, respectively). The elevation in the Study Area ranges from 1,700 to 1,820 feet (510-555 meters) above mean sea level. The Project is located within the Sun City/Menifee Valley Area Plan of the MSHCP, outside of criteria cells and other MSCHP criteria areas (Figure 4). U.S. Fish and Wildlife Service- (USFWS) designated critical habitat for CAGN occurs immediately adjacent to the south of the Study Area.

1.2 PROJECT DESCRIPTION

The Project site encompasses 2.45 acres of the 5.09-acre Study Area and is located on APN 341-050-006 and a sliver of APN 341-050-007 in the Quail Valley area of the City of Menifee, Riverside County, California. The Project consists of the construction of a 1.63-million-gallon (mg) potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure (Figure 5, *Site Plan*).

The tank would have a height of 40 feet and a diameter of 101 feet. The Project is anticipated to require 6,105 cubic yards of cut and 28,741 yards of fill, for a total import of 22,636 cubic yards. Off-site grading to support project activities will occur along South Canyon Drive; impacting approximately 0.072 acre of disturbed habitat. Surrounding land uses include the Quail Valley Water Tank I, approximately 250 feet to the north; the Quail Valley Hydro-pneumatic Water Pump Station to the northeast; a single-family residence to the south; the Quail Valley Water Tank II; approximately 50 feet to the east followed by undeveloped land; and South Canyon Drive and undeveloped land to the west. Access to the Project site is via South Canyon Drive and a private access road.

Specific staging areas have not yet been identified; staging areas would be located within developed portions of the existing facility or the limits of the proposed Project disturbance. Additionally, project construction is assumed to occur over an approximately 17-month period starting in March 2023 and completing in August 2024.

1.3 GENERAL SETTING

The Project site is located on an existing District facility that currently includes two operating water tanks. The Project also includes a pipeline situated in the South Canyon Drive ROW.

1.4 SOILS

The U.S. Department of Agriculture (USDA) web soil survey was reviewed for the types of soil occurring on the Study Area (USDA 2021). Soils in the Study Area are primarily Lodo rocky loam (25 to 50 percent slopes, eroded [Figure 6, *Soils*]). Additional soils present include Ysidora very fine sandy loam (2 to 15 percent slopes, eroded) and Ysidora gravelly very fine sandy loam, 8 to 25 percent eroded).

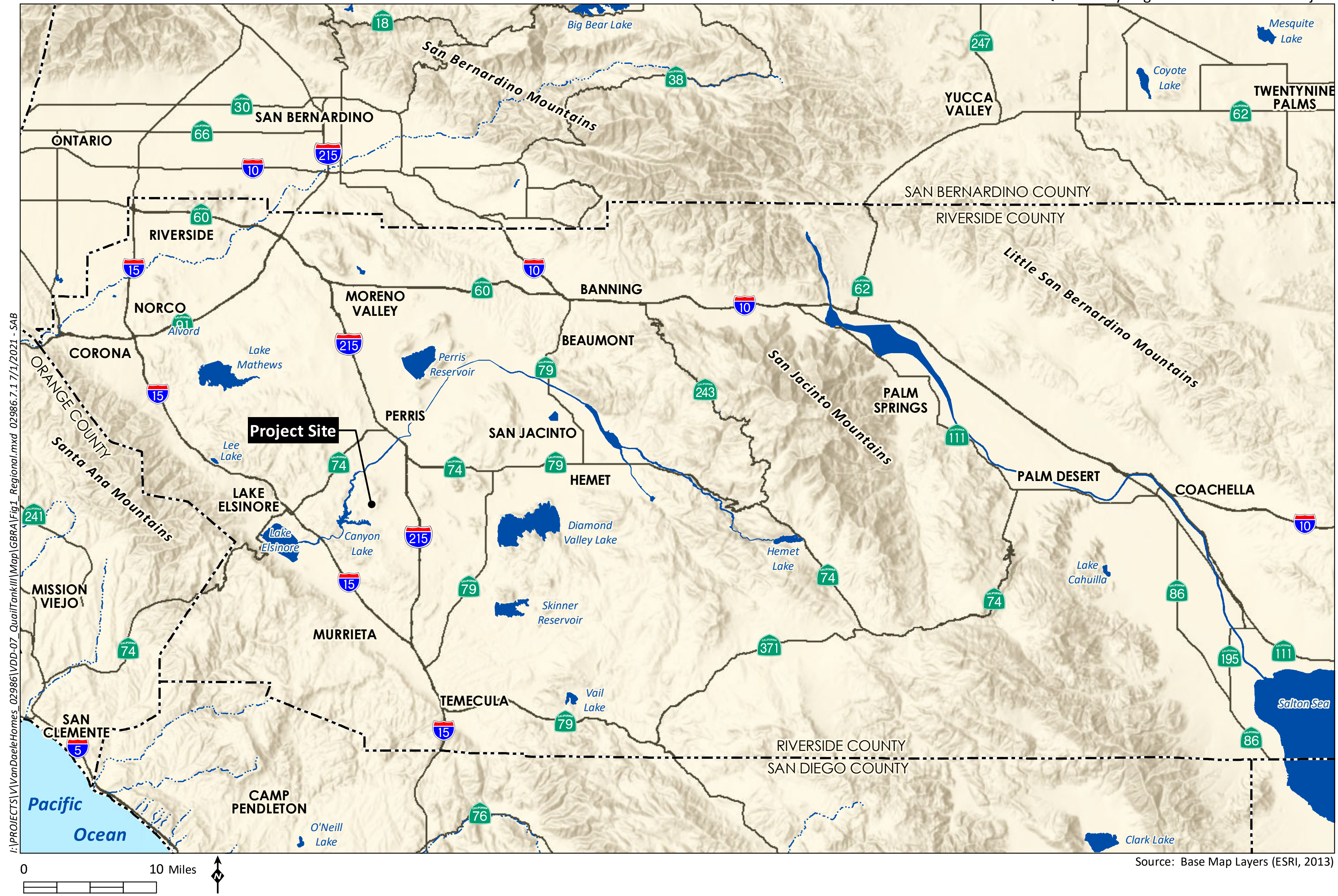
1.5 NOMENCLATURE AND LITERATURE REVIEW

Prior to visiting the property, HELIX biologist Rob Hogenauer conducted a review of the property using aerial photographs (NETRonline 2021) and Google Earth (2021) and a database search for sensitive species known to occur in the area. A query of special status species and habitats databases was conducted using the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB; CDFW 2021) and California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2021). The USFWS' National Wetlands Inventory (NWI) was also reviewed (USFWS 2021). Any recorded locations of species, habitat types, wetlands, and other resources were mapped and overlain onto aerial imagery using Geographic Information Systems. Data pertaining to the MSHCP were also reviewed.

Plants named in this report were identified according to The Jepson Manual: Higher Plants of California (Baldwin et al. 2012) and the Calflora website (2021). Nomenclature also follows Holland (1986) vegetation community classifications, Bradley et al. (2014) for mammals, American Ornithological Society (2021) for birds, the Society for the Center for North American Herpetology (Taggart 2014) for reptiles, and the Butterflies of southern California (Emmel 1973) for butterflies. Names for sensitivity status of plants are from the California Native Plant Society (CNPS; 2020) and sensitive animals names are from the CNDDB (CDFW 2021).

1.6 SURVEY LIMITATIONS

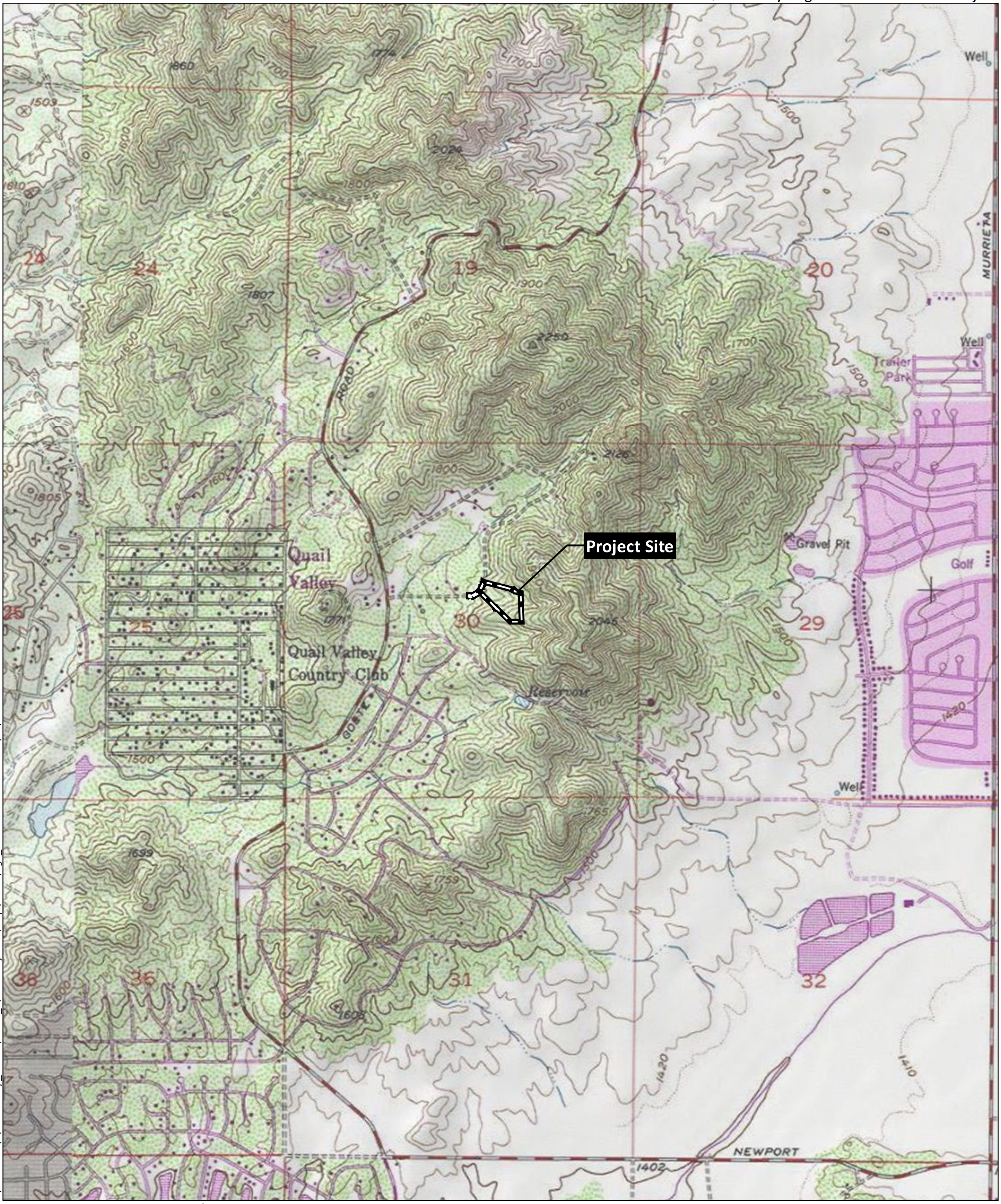
Noted animal species were identified by direct observation, vocalizations, or the observance of scat, tracks, or other signs. However, the lists of animal species identified are not necessarily comprehensive accounts of all species that utilize the Project site, as species that are nocturnal, secretive, or seasonally



HELIX
Environmental Planning

Regional Location

Figure 1



I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\GBRA\Fig2_USGS.mxd 00678.49.1 1/19/2022 - SAB

Source: Romoland 7.5' Quad (USGS)

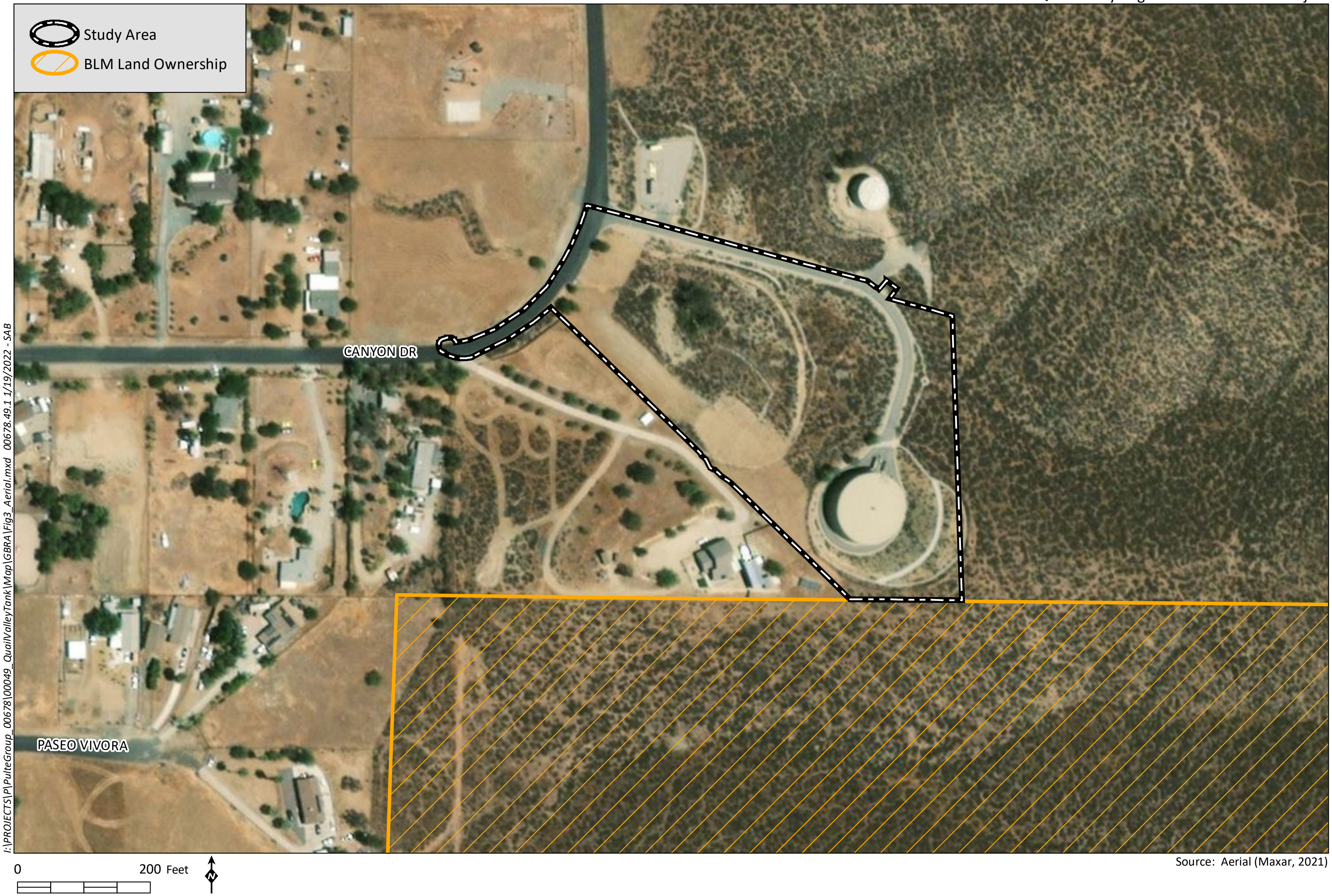
0 2,000 Feet

N

HELIX Environmental Planning

USGS Topography

Figure 2



Source: Aerial (Maxar, 2021)

I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\GBRA\Fig3_Aerial.mxd 00678.49.1 1/19/2022 - SAB

HELIX
Environmental Planning

Aerial Photograph

Figure 3

Quail Valley Regional Water Tank III Project

I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\GBRA\Fig4_MSHCP.mxd 00678.49.1 1/19/2022 - SAB

Source: Aerial (Maxar, 2021)

HELIX
Environmental Planning

MSHCP

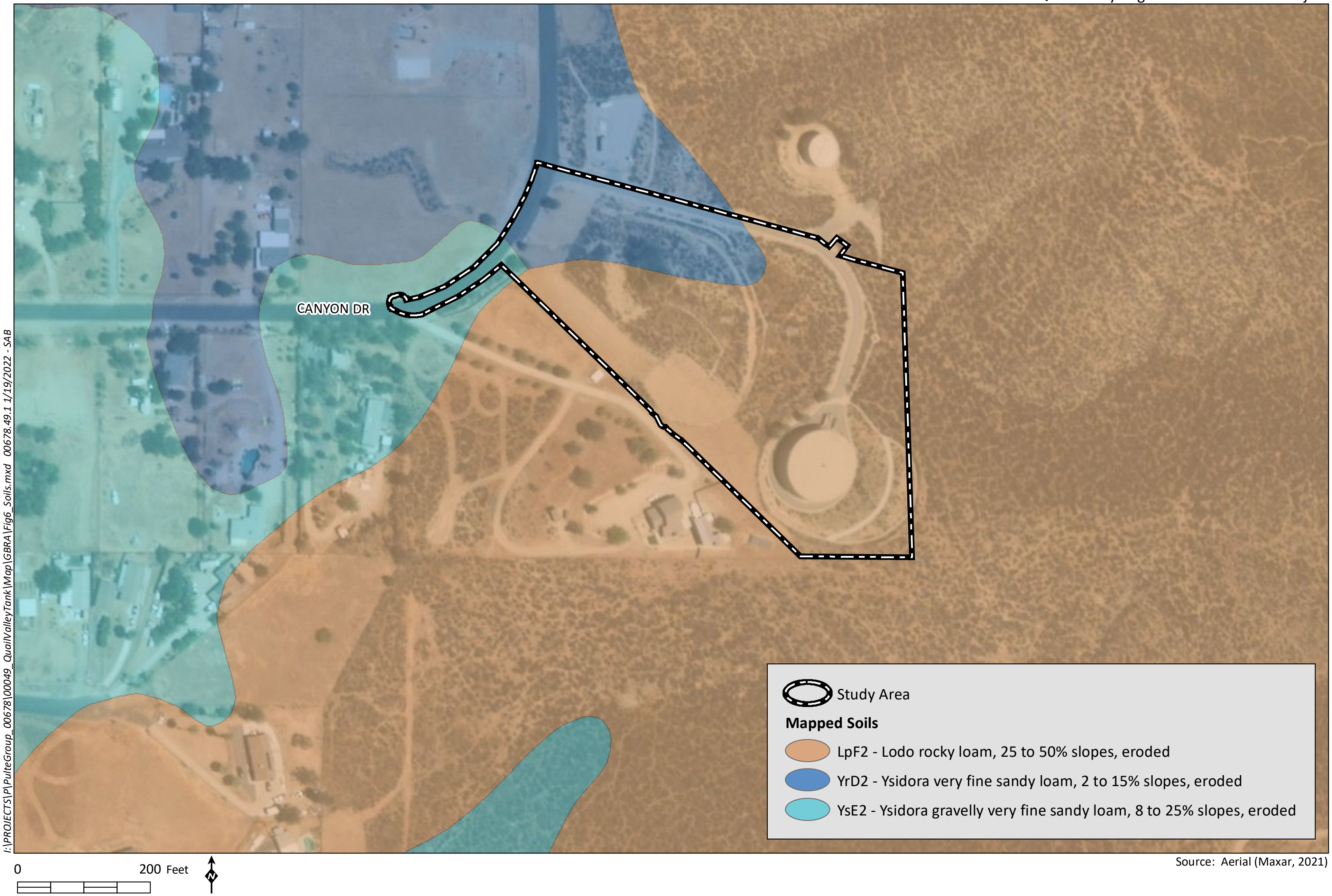
Figure 4

Source: Aerial (Maxar, 2021)

HELIX
Environmental Planning

Project Plans

Figure 5



Source: Aerial (Maxar, 2021)

I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\GBRA\Fig6_Soils.mxd 00678.49.1 1/19/2022 - SAB

HELIX Environmental Planning

Soils

Figure 6

restricted may not have been observed. Those species that are of special status and have the potential to occur in the Project site; however, are still addressed in this report.

2.0 VEGETATION MAPPING

2.1 METHODS

A general habitat assessment and vegetation mapping was conducted by HELIX biologist Rob Hogenauer on April 19, 2021. Vegetation communities within the Study Area were mapped on an aerial photograph (1" = 300' scale). Vegetation types used by the CDFW follow the National Vegetation Classification System (NVCS) using the Manual of California Vegetation (MCV), 2nd Edition (Sawyer et al. 2009). The MCV serves as the California extension of the NVCS. The MCV classifies vegetation based on floristic and structural details that are represented as alliances and associations. Vegetation mapped within the Study Area followed Holland (1986) as modified by Oberbauer et al. (2008) along with utilizing vegetation communities in the MSCHP (Dudek 2003). Direct translations between Holland and MCV do not exist for all vegetation types. Additionally, a single vegetation community under Holland may fit the definition of several different alliances or associations described within the MCV. Vegetation communities mapped within the Study Area were translated to the equivalent classification unit under MCV in order to determine sensitivity rankings. For communities that do not have direct translations within MCV, professional judgment was used to find the best corresponding association or alliance. Typically, a minimum mapping unit size of 0.10 acre is used when mapping upland habitat and 0.01 acre when mapping wetland and riparian habitat but due to the small size of the Project, a 0.01-acre mapping unit size was used for both. A list of all plant and animal species observed or detected within the Study Area was prepared. Plant species were identified in the field or later in the laboratory with the aid of voucher specimens (Appendix A). Animals were identified in the field by direct visual observation with the aid of binoculars or indirectly by detection of calls, tracks, burrows, or scat (Appendix B).

2.2 RESULTS

There are four plant alliances, associations, or semi-natural stands present within the Study Area and an additional two habitats/land uses that do not directly fit MCV categories (Table 1, *Vegetation Communities and Land Covers*; Figure 7, *Vegetation*). For communities not described by the MCV, of which there are two, the communities were described using the Holland/Oberbauer code distribution. The communities and land covers in the Study Area are California buckwheat scrub including disturbed, Mediterranean grass grasslands, pepper tree grove, disturbed and developed. A brief description of each community/land cover within the Study Area is provided below.

Table 1
VEGETATION COMMUNITIES AND LAND COVERS

MCV Code	MCV Alliance/ Association[1]	MCV Common Name	Holland Code[2]	Holland/MSHCP Classification[2]	Acres in Study Area[2]
Riparian Forests and Woodlands					
4.23.1	*Eriogonum fasciculatum* Association	California Buckwheat Scrub	32500	Riversidean Sage Scrub	0.98
4.23.1	*Eriogonum fasciculatum* Association	California Buckwheat Scrub	32500	Riversidean Sage Scrub-Disturbed	1.38
42.024.00	*Bromus rubens-schismus Herbaceous Semi-Natural Alliance*	Mediterranean grass grasslands	42200	Non-native grassland	0.44
79.200.00	*Schinus-Myoporum laetum forest and woodland Semi-natural alliance*	Pepper Tree Groves	79000	Non-native Woodland	0.07
N/A	Not Available	Not Available	11300	Disturbed Habitat	0.87
N/A	Not Available	Not Available	12000	Developed Land	1.35
				Total	**5.09**

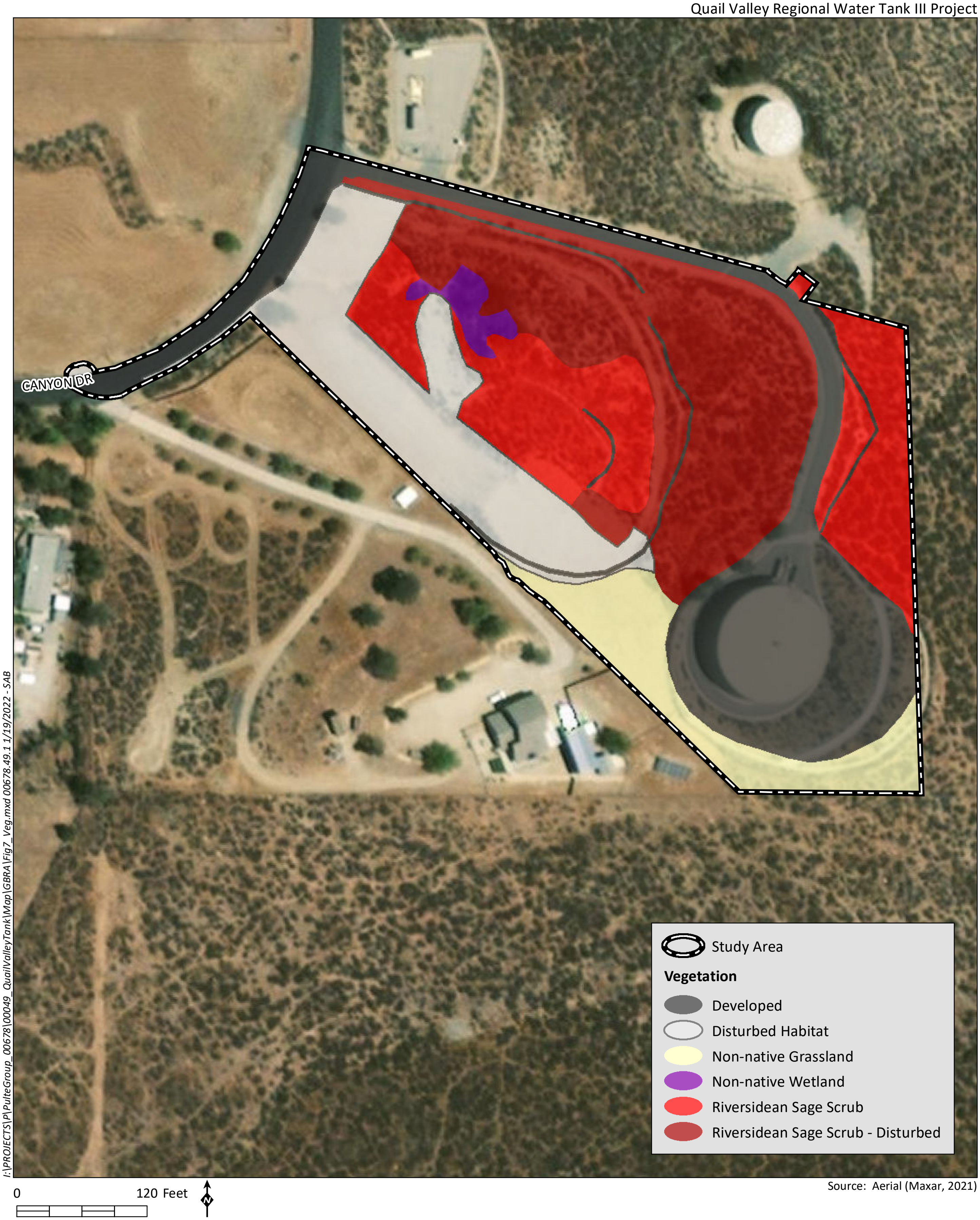
1 The Vegetation Classification Manual does not classify generally unvegetated habitats such as those found in the Oberbauer updated Holland classification system: developed and disturbed habitat.
2 Vegetation categories and numerical codes are from Holland (1986) and Oberbauer (2008).
3 Due to the small nature of the Project and associated Study Area, all vegetation has been rounded to nearest 0.01 acre.
MCV = Manual of California Vegetation; MSHCP = Multiple Species Habitat Conservation Plan

2.2.1 California Buckwheat Scrub (Riversidean Sage Scrub including Disturbed)

California buckwheat scrub or Riversidean sage scrub is the most xeric expression of coastal sage scrub, typically found on xeric sites such as steep slopes, severely drained soils, or clays that release stored soil moisture slowly. Typical stands are fairly open and dominated by California buckwheat (*Eriogonum fasciculatum),* brittlebush (*Encelia farinosa*), California sagebrush (*Artemisia californica*), and foxtail chess (*Bromus madritensis* ssp. *Rubens*). Riversidean sage scrub within the Study Area is dominated by California buckwheat. Approximately 0.98 acre of Riversidean sage scrub and 1.38 acres of Riversidean sage scrub disturbed occur within the Study Area.

2.2.2 Mediterranean Grass Grasslands (Non-native Grassland)

Mediterranean grass grasslands or non-native grassland is a dense to sparse cover of annual grasses, often associated with numerous species of showy-flowered native annual forbs. Characteristic species include oats (*Avena* spp.), brome grasses (*Bromus* spp.), and mustards (*Brassica* spp., *Hirschfeldia incana*). Most of the annual introduced species within the non-native grassland originated from the Mediterranean region, an area with a long history of agriculture and a climate similar to California. Intensive grazing and agricultural practices, combined with severe droughts in California, contributed to the successful invasion and establishment of these species and the replacement of native grasslands with annual-dominated non-native grasslands.



I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\GBRA\Fig7_Veg.mxd 00678.49.1 1/19/2022 - SAB

Source: Aerial (Maxar, 2021)

HELIX Environmental Planning

Vegetation

Figure 7

Within the Study Area, non-native grassland habitat is dominated by wild oat, foxtail chess, dove weed (*Croton setiger*), stinknet (*Oncosiphon pilulifer*), tocalote (*Centaurea melitensis*), and mouse barley (*Hordeum murinum*). Approximately 0.44 acre of non-native grassland occurs in the Study Area.

2.2.3 Pepper Tree Groves (Non-native Woodland)

Non-native woodland is tree dominated habitat comprised of exotic/non-native species. This habitat often occurs as an ornamental planting for the purpose of shade, use as a windrow, or other objectives. In the Study Area, this habitat consists of a small patch of trees dominated by Peruvian pepper (*Schinus molle*). There is 0.07 acre of non-native woodland in the Study Area.

2.2.4 Disturbed Habitat

Disturbed habitat includes land cleared of vegetation (e.g., dirt roads), land containing a preponderance of non-native plant species, such as ornamentals or ruderal exotic species that take advantage of disturbance (previously cleared or abandoned landscaping), or land showing signs of past or present animal usage that removes any capability of providing viable habitat.

Within the Study Area, disturbed habitat consists of bare ground with scattered annual non-native species, including short-podded mustard (*Hirschfeldia incana*), filaree (*Erodium cicutarium*), stinknet, dove weed, and common fiddleneck (*Amsinckia menziesii*). Disturbed habitat covers approximately 0.87 acre of the Study Area and consists of dirt roads, residential habitat, and land with only ruderal vegetative growth due to the prior clearing of vegetation during prior impacts.

2.2.5 Developed Land

Developed land includes areas that have been constructed upon or otherwise covered with a permanent, unnatural surface and may include, for example, structures, pavement, irrigated landscaping, or hardscape to the extent that no natural land is evident. These areas no longer support native or naturalized vegetation. Developed portions of the Study Area consist of paved roads and access paths, a water tank, concrete brow ditches, and landscaping associated with the tank and an adjacent residence. A total of 1.35 acres of Developed land occurs in the Study Area.

2.3 IMPACTS

The proposed Project would result in 2.24 acres of permanent impacts and 0.21 acre of temporary impacts of habitat. The impacts consist of 0.58 acres Riversidean sage scrub, 0.75 acre Riversidean sage scrub disturbed, 0.18 acre non-native grassland, 0.07 acre non-native woodland, 0.67 acre disturbed habitat, and 0.20 acre developed land (Table 2, *Vegetation Impacts for the Quail Tank III Project;* Figure 8, *Vegetation/Impacts*).

Table 2
VEGETATION IMPACTS FOR THE QUAIL TANK III PROJECT[1]

Habitat	Existing	On-site Permanent Impacts	On-site Temporary Impacts	On-site Total Impacts	Avoided	Off-site Temporary Impacts (Grading)
Riversidean Sage Scrub	0.98	0.58	<0.01	0.58	0.40	0.008
Riversidean Sage Scrub-Disturbed	1.38	0.66	0.09	0.75	0.63	0
Non-native grassland	0.44	0.13	0.05	0.18	0.26	0
Non-native Woodland	0.07	0.07	0	0.07	0	0
Disturbed Habitat	0.87	0.61	0.06	0.67	0.2	0.063
Developed Land	1.35	0.19	0.01	0.20	1.15	0
Total	**5.09**	**2.24**	**0.21**	**2.45**	**2.64**	**0.072**

[1] Due to the small nature of the Project and associated Study Area, all vegetation has been rounded to nearest 0.01 acre.

2.4 MITIGATION

The project will require mitigation for impacts to vegetation communities. Impacts to disturbed habitat and developed land are not considered significant and do not require mitigation, as they do not represent habitat with potential to support native plant or animals. Impacts to Riversidean sage scrub are considered significant. Projects within the MSHCP plan area are subject to an MSHCP mitigation fee.

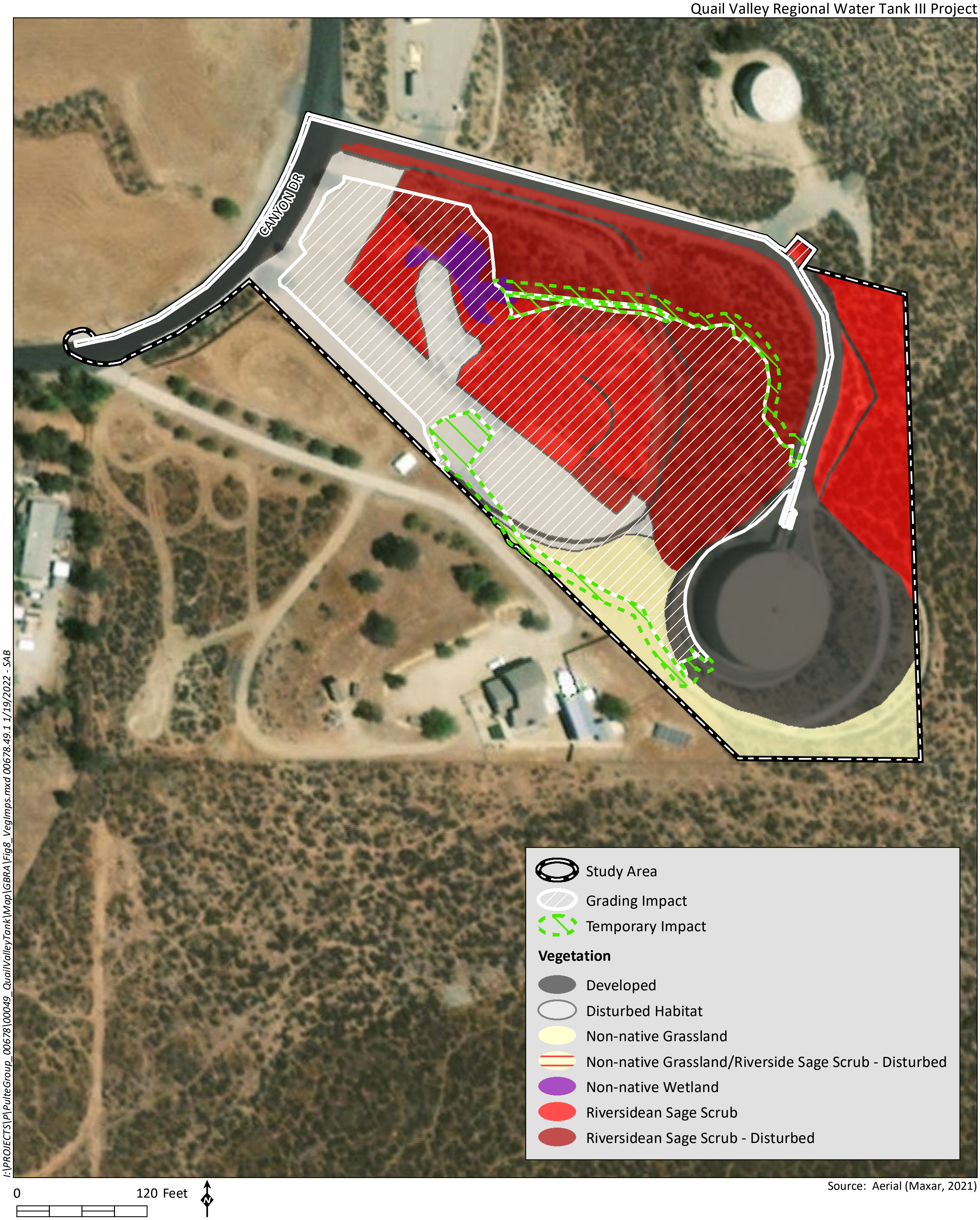
The temporary impact areas will be returned to pre-construction grades and compaction. Portions of the project site impacted by construction activities, such as the graded slopes and the stockpile area, will be revegetated with native plantings and/or hydroseeded with a native seed mix. Therefore, preparation of a restoration plan should not be required. Additional avoidance, minimization, and mitigation measures are discussed in Section 11.4.

3.0 AQUATIC RESOURCE DELINEATION

3.1 METHODS

Prior to beginning fieldwork, aerial photographs (1 inch = 100 feet), USGS quadrangle maps, and NWI maps (USFWS 2020) were reviewed to assist in determining the location of potential jurisdictional waters in the Study Area. Prior to the delineation, recent aerial photographs (1" = 100'), topographic maps (1" = 100'), soil mapping, and National Wetlands Inventory were reviewed to determine the location of potential jurisdictional areas. The delineation was conducted on foot with the aid of 1" =100' scale aerials and topographic maps. Data collection was targeted in areas that were deemed to have the potential to support jurisdictional resources, such as the presence of an ordinary high water mark (OHWM), the presence of a bed/bank and streambed associated vegetation, and/or other surface indications of streambed hydrology. Potential jurisdictional features were mapped at a scale of one-hundredth of an acre (0.01 acre). The USACE Nation Wetland Plant list was used to determine the wetland status of plants (USACE 2022).

HELIX biologist Rob Hogenauer conducted the aquatic resource delineation on-site study on April 19, 2021 and updated the delineation on January 17, 2022. The effort was conducted to identify



Source: Aerial (Maxar, 2021)

HELIX
Environmental Planning

Vegetation/Impacts

Figure 8

jurisdictional waters potentially subject to U.S. Army Corps of Engineers (USACE) jurisdiction pursuant to Section 404 of the Clean Water Act (CWA), Regional Water Quality Control Board (RWQCB) jurisdiction pursuant to Section 401 of the CWA, and streambed habitats potentially subject to CDFW jurisdiction pursuant to Sections 1600 et seq. of the CFG Code. Information regarding MSHCP Riparian/Riverine and Vernal Pool Resources were also collected during the aquatic resource delineation and discussed in the appropriate section below. Data collection was targeted in areas deemed to have the potential to support aquatic resources, such as the presence of an OHWM, the presence of a bed/bank and streambed associated vegetation, and/or other surface indications of streambed hydrology. Potential features were mapped at a scale of one-hundredth of an acre (0.01 acre). Potential waters of the U.S. were delineated to the width of the OHWM.

Potential RWQCB-jurisdictional areas, waters of the state, were delineated to the top of the bank where water flows. All waters of the state are subject to jurisdiction pursuant to the CWA Section 401, or for isolated features that are not considered waters of the U.S., they are subject to the exclusive regulatory jurisdiction of the RWQCB pursuant to the State Porter-Cologne Water Quality Control Act.

The CDFW jurisdictional boundaries were determined based on the presence of riparian vegetation or regular surface flow if present. Streambeds within CDFW jurisdiction were delineated based on the definition of streambed as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses with surface or subsurface flow that supports riparian vegetation” (Title 14, Section 1.72). This definition for CDFW jurisdictional habitat allows for a wide variety of habitat types to be jurisdictional, including some that do not include wetland species (e.g., oak woodland and AFSS). The CDFW jurisdictional habitat includes all riparian shrub or tree canopy that may extend beyond the banks of a stream. Jurisdictional limits for CDFW streambeds were defined by the top of bank. Vegetated CDFW habitats were mapped at the limits of streambed-associated vegetation if present.

3.2 RESULTS

The NWI did not show wetland as occurring within the Study Area. The Study Area has been previously disturbed by the construction of the existing water tank and associated structures. Aquatic resources observed within the Study Area include a single ephemeral drainage. The drainage originates west of the Study Area as a natural drainage and is collected on site via a drainage pipe and crosses the Study Area via two culverts and surface flow, and back to the original drainage course (Figure 9, *Aquatic Resources*).

3.2.1 Waters of the U.S.

Based on the presence of an OHWM, the drainage was determined to be non-wetland waters of the U.S. There is a section in the middle of the drainage that has a discontinuous OHWM. Vegetation in the drainage was mostly non-existent with the exception of annual plants similar to the surrounding upland, a few scattered California buckwheat (*Eriogonum fasciculatum*). Other plant species observed within the limits of the waters of the U.S. are foxtail chess (*Bromus madritensis*), fescue (*Festuca myuros*), and California sagebrush (*Artemisia californica).* All of the plant species observed within the waters of the U.S. have a wetland rating of upland or are not indicator species. Due to the lack of wetland plants, wetland waters of the U.S. do not occur in the Study Area. The drainage is comprised of 0.012 acre and 423 linear feet of ephemeral non-wetland waters of the U.S. plus 0.01 acre rip/rap at culvert outfalls and 0.01 acre and 198 linear feet of culvert (Table 3, *USACE Jurisdictional Waters*).

Table 3
USACE JURISDICTIONAL WATERS

Habitat Type	Permanent Acres	Permanent Linear Feet*
Non-wetland Waters of the U.S.		
Ephemeral Drainage	0.012	423
Rip/Rap	0.01	35
Culvert	0.01	198
Totals*	**0.032**	**656**

*Culvert acreage based on 3-foot wide pipe.

3.2.2 Regional Water Quality Control Board Jurisdictional Waters

The drainage was determined to be jurisdictional to RWQCB. No riparian or other stream-dependent vegetation was determined to be present along the drainage. The limits of jurisdiction were measured to the top of bank. Potential RWQCB jurisdictional habitat in the Study Area is 0.048 acre and 423 linear feet of ephemeral streambed. Additional features along the drainage include 0.01 acre rip/rap at culvert outfalls and 0.01 acre and 198 linear feet of culvert (Table 4, *Aquatic Resources [CDFW/RWQCB]*).

Table 4
AQUATIC RESOURCES (CDFW and RWQCB)

Habitat Type	Acres	Linear Feet
Drainage/Ephemeral Streambed	0.048	423
Rip/Rip	0.01	35
Culvert	0.01*	198
Totals	**0.068**	**656**

*Culvert acreage based on 3-foot wide pipe.

3.2.3 CDFW Jurisdictional Waters

The drainage was determined to be jurisdictional to CDFW. No riparian or other stream-dependent vegetation was determined to be present along the streambed. The limits of jurisdiction were measured to the top of the bank. Potential CDFW jurisdiction in the Study Area is 0.048 acre and 423 linear feet of ephemeral streambed. Additional features along the drainage include 0.01 acre rip/rap at culvert outfalls and 0.01 acre and 198 linear feet of culvert (Table 4). Vegetation along the drainage is sparse for most of the drainage course. Where vegetation does occur along the drainage, it is similar to the surrounding upland vegetation. No riparian vegetation occurs in the Study Area.

3.3 IMPACTS

Proposed impacts to the drainage result from grading for the new tank, construction of a water quality basin to collect runoff from tanks, and an outfall from the basin. The outfall from the basin will be in line with the existing drainage at the edge of the Study Area, where the existing drainage enters a culvert under South Canyon Drive. The Project proposes to impact nearly all of the drainage within the Study Area (Figure 10, *Aquatic Resources/Impacts*). The Project will avoid the upper reach of the culvert that connects to the natural drainage and 38 feet of the upper reach of the natural drainage that continues upstream off site to the southeast.

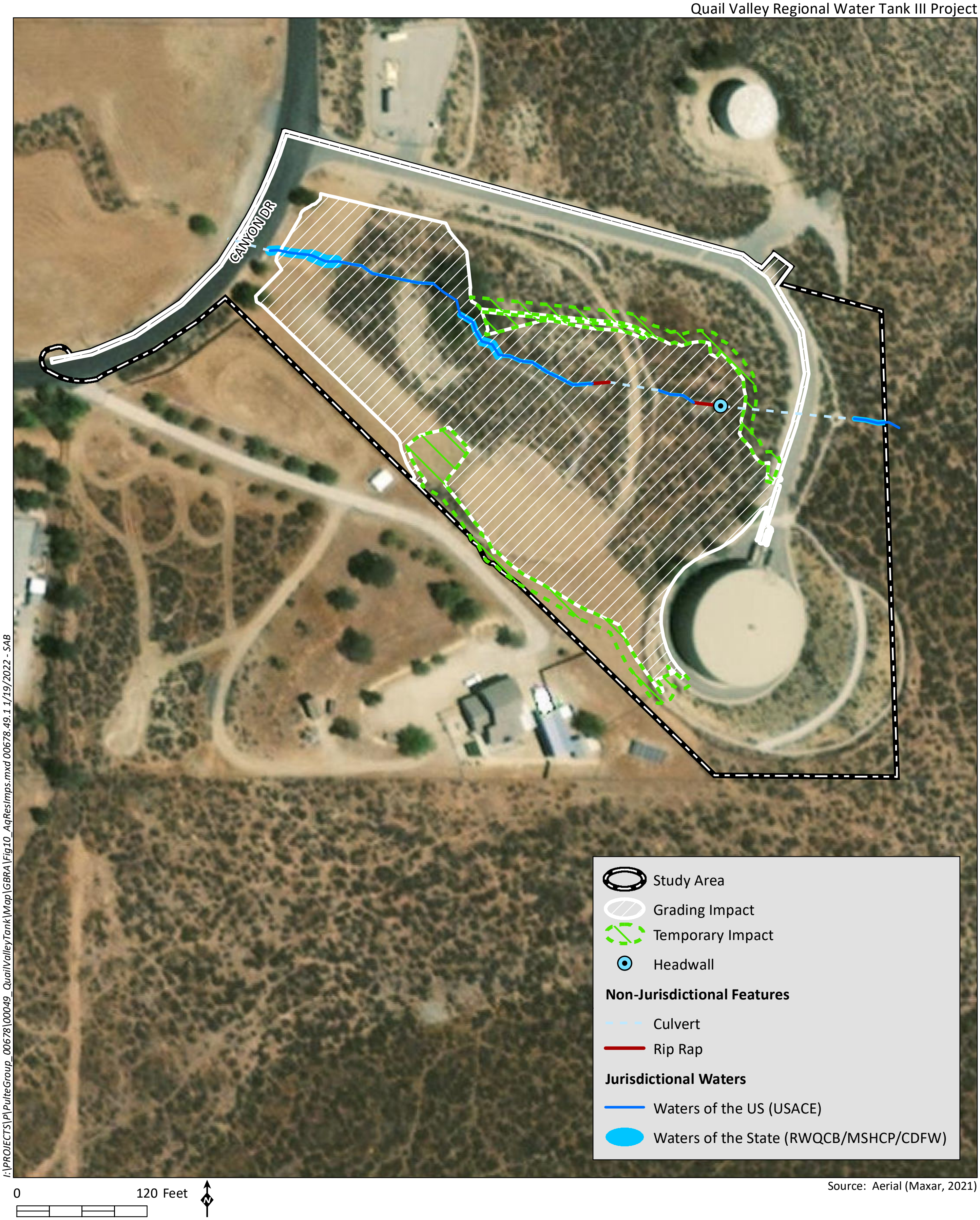
I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\GBRA\Fig9_AqRes.mxd 00678.49.1 1/19/2022 - SAB

Source: Aerial (Maxar, 2019)

HELIX Environmental Planning

Aquatic Resources

Figure 9



Source: Aerial (Maxar, 2021)

HELIX Environmental Planning

Aquatic Resources/Impacts

Figure 10

The Project proposes to connect a 30-inch Corrugated Metal Pipe or similar approved items to the existing culvert and have flows outfall into the proposed water quality basin. The outfall of the water quality basin will occur at the location of the existing culvert under South Canyon Road that connects to the existing downstream drainage.

3.3.1 Potential USACE Impacts

The Project proposed to impact 0.01 acre and 385 linear feet of ephemeral non-wetland waters of the U.S. These will all be permanent impacts. These impacts will require a Clean Water Act Section 404 permit from USACE. Nationwide Permit 58 for Utility Line Activities for Water and Other Substances is anticipated to be used for this Project. The Project will also impact 0.003 acre of rip/rap and 0.005 acre of culvert that will be replaced as part of the Project design (Table 5, *USACE Jurisdictional Impacts*).

Table 5
USACE JURISDICTIONAL IMPACTS

Habitat Type	Acres*	Linear Feet
Non-wetland waters of the U.S.		
Ephemeral Drainage	0.01	385
Rip/Rap	0.003	35
Culvert	0.005	83
Totals*	**0.018**	**503**

*Impacts are show to the nearest 0.001 acre due to the small size of the impacts.

3.3.2 Proposed CDFW and RWQCB Impacts

The proposed impacts total 0.042 acre ephemeral stream, along with 0.01 acre rip/rap, and 0.005 acre culvert (Table 6, *CDFW/RWQCB Jurisdictional Impacts*). These will all be permanent impacts. The rip/rap and culvert are to be replaced on site as part of the Project design.

The Project will require notification for a Streambed Alteration Agreement (SAA) from the CDFW and a request for Clean Water Act Section 401 water quality certification from RWQCB.

Table 6
CDFW/RWQCB JURISDICTIONAL IMPACTS

Habitat Type	Acres*	Linear Feet
Ephemeral Streambed	0.042	385
Rip/Rap	0.01	35
Culvert	0.005	83
Totals*	**0.057**	**503**

*Impacts are show to the nearest 0.001 acre due to the small size of the impacts.

3.4 MITIGATION

The Project will be required to mitigate for impacts to USACE, CDFW, and RWQCB resources. The functions and values of the culvert and rip/rap will be replaced via the installation of additional culvert and rip/rap as part of the Project design. No additional mitigation is proposed for impacts to culvert and rip/rap. Due to the Project's small size and limited available space, on-site mitigation is not feasible for the impacts to streambed. As a result, the Project proposes to mitigate impacts using a mitigation bank or in-lieu fee credits such as the Riverpark Mitigation Bank. Mitigation proposed below is subject to change as a result of negotiation with the resource agencies during the permitting process. Mitigation is proposed to occur as a purchase of re-establishment and/or rehabilitation credits within the Riverpark Mitigation Bank. The mitigation bank credits will be for resources with an equal or higher value than the resources being impacted. The Riverpark Mitigation Bank occurs within the planning boundaries of the MSHCP and is approved by the USACE, CDFW, and RWQCB.

3.4.1 USACE Mitigation

Permanent impacts to 0.01 acre and 385 linear feet of ephemeral non-wetland waters of the U.S. are proposed to be mitigated at a ratio of 2:1, with a minimum 1:1 establishment/re-establishment component. Mitigation is proposed to be the purchase of 0.02 acre re-establishment and/or rehabilitation credits from the Riverpark Mitigation Bank or an alternative method approved by the USACE (Table 7, *USACE Mitigation*).

Table 7
USACE MITIGATION

Habitat Type	Acres	Ratio	Mitigation
Permanent			
Non-wetland Waters of the U.S.	0.01	2:1	0.02
Totals	**0.01**		**0.02**

3.4.2 CDFW and RWQCB Mitigation

Permanent impacts to 0.042 acre and 385 linear feet of ephemeral stream are proposed to be mitigated at a 2:1 ratio, with a minimum 1:1 establishment/re-establishment component. Because the remaining 0.006 acre of ephemeral streambed on site, that would remain unimpacted, would not be placed in long-term conservation, this acreage is required to be included in the mitigation acreage. The result is a total mitigation purchase of 0.096 acre of re-establishment and/or rehabilitation credits from the Riverpark Mitigation Bank or alternative method approved by the CDFW and RWQCB (Table 8, *CDFW/RWQCB Mitigation*). The impacts to rip/rap and culvert will be replaced on site as part of the Project design.

Table 8
CDFW AND RWQCB MITIGATION

Habitat Type	Acres	Ratio	Mitigation
Permanent			
Ephemeral Stream	0.048	2:1	0.096
Totals	**0.048**		**0.096**

4.0 REGULATORY CONTEXT

4.1 FEDERAL GOVERNMENT

4.1.1 Federal Endangered Species Act

Administered by the USFWS, the federal ESA provides the legal framework for the listing and protection of species (and their habitats) identified as being endangered or threatened with extinction. Actions that jeopardize endangered or threatened species, and the habitats upon which they rely, are considered take under the ESA. Section 9(a) of the ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" and "harass" are further defined in federal regulations and case law to include actions that adversely impair or disrupt a listed species' behavioral patterns.

Sections 7 and 4(d) of the Federal ESA regulate actions that could jeopardize endangered or threatened species. Section 7, administered by the USFWS, describes a process of Federal interagency consultation for use when Federal actions may adversely affect listed species. A Section 7 Consultation (formal or informal) is required when there is a nexus between a listed species' use of a site and if the Project is funded (wholly or in part) by the State Revolving Fund. A biological assessment is required for any major construction activity if it may affect a listed species. Take can be authorized via a letter of Biological Opinion, issued by the USFWS, for non-marine related listed species issues. The Project would be funded in part by the State Resolving Fund. A Section 7 Consultation would be required if impacts to a federally listed species would occur.

Identified by the USFWS, critical habitat is defined as areas of land that are considered necessary for endangered or threatened species to recover. The ultimate goal is to restore healthy populations of listed species within their native habitat, so they can be removed from the list of threatened or endangered species. Once an area is designated as critical habitat pursuant to the federal ESA, all federal agencies must consult with the USFWS to ensure that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of the critical habitat.

4.1.2 Migratory Bird Treaty Act

All migratory bird species that are native to the United States or its territories are protected under the federal Migratory Bird Treaty Act (MBTA), as amended under the Migratory Bird Treaty Reform Act of 2004 (FR Doc. 05-5127). The MBTA is generally protective of migratory birds but does not actually stipulate the type of protection required. In common practice, the MBTA is used to place restrictions on the disturbance of active bird nests during the nesting season. The nesting season is generally February 1 to August 31 but is often extended to s September 15 depending upon the jurisdiction or habitat. In addition, the USFWS commonly places restrictions on disturbances allowed near active raptor nests.

4.1.3 Clean Water Act and Rivers and Harbors Act

Federal wetland regulation (non-marine issues) is guided by the Rivers and Harbors Act of 1899 and the CWA. The Rivers and Harbors Act deals primarily with discharges into navigable waters, while the purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of all waters of the U.S. Permitting for projects filling waters of the U.S. is overseen by the USACE under

Section 404 of the CWA and by the RWQCB under Section 401 of the CWA. Many ephemeral waters in California no longer fall under the jurisdiction of the USACE due to a recent change in the regulations. Most development projects with impacts to federal waters are permitted using Individual Permit or Nationwide Permit instruments.

4.2 STATE OF CALIFORNIA

4.2.1 California Environmental Quality Act

Primary environmental legislation in California is found in CEQA and its implementing guidelines (State CEQA Guidelines), which require that projects with potential adverse effects (i.e., impacts) on the environment undergo environmental review. Adverse environmental impacts are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

4.2.2 California Endangered Species Act

The California Endangered Species Act (CESA) established it is state policy to conserve, protect, restore, and enhance state endangered species and their habitats. Under state law, plant and animal species may be formally designated rare, threatened, or endangered by official listing by the CFG Commission. The CESA authorizes that private entities may "take" plant or wildlife species listed as endangered or threatened under the FESA and CESA, pursuant to a federal Incidental Take Permit if the CDFW certifies that the incidental take is consistent with CESA (CFG Code Section 2080.1[a]). For state-only listed species, Section 2081 of the CFG Code authorizes the CDFW to issue an Incidental Take Permit for state listed threatened and endangered species if specific criteria are met. The MSCP is a regional Natural Communities Conservation Plan granted take coverage under Section 2081 of the CESA.

4.2.3 Native Plant Protection Act

Sections 1900–1913 of the CFG Code (Native Plant Protection Act; NPPA) direct the CDFW to carry out the state legislature's intent to "…preserve, protect, and enhance endangered or rare native plants of this state." The NPPA gives the CFG Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take.

4.2.4 California Fish and Game Code

The CFG Code provides specific protection and listing for several types of biological resources. Section 1600 of the CFG Code requires an SAA for any activity that would alter the flow, change, or use any material from the bed, channel, or bank of any perennial, intermittent, or ephemeral river, stream, and/or lake. Typical activities that require an SAA include excavation or fill placed within a channel, vegetation clearing, structures for diversion of water, installation of culverts and bridge supports, cofferdams for construction dewatering, and bank reinforcement. Notification is required prior to any such activities.

Pursuant to CFG Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Raptors and owls and their active nests are protected by CFG Code Section 3503.5, which states that it is unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird unless authorized by the CDFW. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the MBTA. These regulations could require that construction activities (particularly vegetation removal or construction near nests) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by CDFW and/or USFWS.

4.2.5 State Porter-Cologne Act

Waters of the state that are not subject to regulation under the CWA are regulated by the RWQCB under the Porter-Cologne Act. Waters of the state regulated under the Porter-Cologne Act are subject to similar restrictions as those regulated under Section 401 of the CWA. The purpose of the RWQCB under the Porter-Cologne Act is to restore and maintain the chemical, physical, and biological integrity of all waters of the state. Projects with impacts to waters of the state will be subject to Waste Discharge Regulations from the RWQCB.

4.3 WESTERN RIVERSIDE MULTIPLE SPECIES HABITAT CONSERVATION PLAN

The MSHCP is a comprehensive multi-jurisdictional effort that includes multiple cities and unincorporated County lands in western Riverside County. Rather than addressing sensitive species on an individual basis, the MSHCP focuses on the conservation of 146 species, proposing a reserve system of approximately 500,000 acres and a mechanism to fund and implement the reserve system (Dudek 2003). Most importantly, the MSHCP allows participating entities to issue take permits for listed species so that individual applicants need not seek their own permits from the USFWS and/or CDFW. The MSHCP was adopted on June 17, 2003, by the Riverside County Board of Supervisors. The Incidental Take Permit was issued by both the USFWS and CDFW on June 22, 2004.

The Eastern Municipal Water District (EMWD) is not a signatory to the MSHCP, and as such is not subject to the requirements of the MSHCP. However, EMWD has elected to apply for take authorization for activities by receiving coverage through the Participating Special Entity (PSE) process. The PSE process allows an entity such as the EMWD to receive the benefits of the MSHCP for a specific project. The MSHCP defines a PSE as "any regional public facility provider, such as a utility company, a public district or agency, which operates and/or owns land within the MSHCP Plan Area and that applies for Take Authorization pursuant to Section 11.8 of [the MSHCP]." As a PSE for this Project, the EMWD must comply with the requirements set forth in MSHCP section 6.1.2, 6.1.3, 6.1.4, and 6.3.2. The Project must also pay a fee of five percent of the capital cost of the Project to use the MSCHP. This fee is the PSE equivalent of the Local Development Mitigation Fee (LDMF). The EMWD is the lead agency under CEQA, but the MSHCP compliance will be through the Regional Conservation Authority (RCA).

5.0 MSHCP RESERVE ASSEMBLY ANALYSIS

The Quail Valley Regional Water Tank III Project is located within the Sun City/Menifee Valley Area Plan of the MSHCP. The Study Area is not within or adjacent to a Criteria Cell but is adjacent to BLM public quasi-public (PQP) land (Figure 4, *MSHCP*). The nearest cells are situated approximately 7,500 feet north and west of the Study Area and are separated from the Study Area by a mix of undeveloped land and residential development. The Study Area is not targeted for conservation. No on-site conservation is required for MSHCP reserve assembly.

5.1 PUBLIC QUASI-PUBLIC LANDS

The Project is bordered by PQP land to the south, but PQP lands do not occur within the Project limits. The PQP land is an isolated block that is not directly connected to other conserved land. Residential development borders the PQP land to the east and west, and with undeveloped land to the north and south.

5.1.1 Impacts

The PQP lands occur immediately adjacent to the south side of the Project limits, but no impacts to PQP lands are proposed. The proposed Project impacts are separated from the PQP lands by the existing Quail Tank 1 situated along the southern border of the Project parcels. Impacts from the proposed Project are expected to come no closer than 65 feet from the PQP lands.

5.2 LOCAL DEVELOPMENT MITIGATION/PSE FEE

Projects within the MSCHP plan area are subject to the MSHCP LDMF. However, as a PSE, this fee is replaced with the PSE fee. For this Project, the fee is five percent of the capital cost of the Project to be paid to the RCA. MSHCP reserve land purchase and management are funded by the collection of the LDMF (in this case the PSE fee).

5.3 STEPHENS' KANGAROO RAT HABITAT CONSERVATION PLAN FEES

Because the Project is within the Stephens' Kangaroo Rat Habitat Conservation Plan (SKRHCP) area, the Project Proponent is required to pay a Stephens' kangaroo rat mitigation in accordance with the SKRHCP. The SKRHCP fee is $500 per acre (County 1996).

6.0 PROTECTION OF SPECIES ASSOCIATED WITH RIPARIAN/RIVERINE AREAS AND VERNAL POOLS (SECTION 6.1.2)

The MSHCP requires that all PSE projects be assessed for MSHCP Section 6.1.2 resources, including riparian/riverine resources, vernal pools fairy shrimp, and riparian birds. The goal is to protect resources used by MSHCP-covered species, as well as the existing and future downstream conservation areas.

According to Section 6.1.2 of the MSHCP:

> "**Riparian/Riverine Areas** are lands which contain Habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year."
>
> "**Vernal pools** are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands 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, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by-case basis. Such determinations should consider the length of the time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses to which it has been subjected, and weather and hydrologic records."
>
> "**Fairy Shrimp**. For Riverside, vernal pool and Santa Rosa fairy shrimp, mapping of stock ponds, ephemeral pools and other features shall also be undertaken as determined appropriate by a qualified biologist.
>
> "With the exception of wetlands created for the purpose of providing wetlands Habitat or resulting from human actions to create open waters or from the alteration of natural stream courses, areas demonstrating characteristics as described above which are artificially created are not included in these definitions."

Note that the MSHCP states that "areas demonstrating characteristics [of riparian/riverine habitat] which are artificially created are not included in these definitions" of riparian/riverine habitat. The identification of Riparian/Riverine and Vernal Pool habitats is based on the potential for the habitat to support Riparian/Riverine and Vernal Pool Covered Species, which are identified in Section 6.1.2 of the MSHCP. These species include least Bell's vireo (*Vireo bellii pusillus*) and a suite of other animals and plants outlined in Section 6.1.2 of the MSHCP. During the aquatic resource survey on April 19, 2021, the Study Area was evaluated for habitat that could support animals and/or plants identified by the MSHCP as Riparian/Riverine and Vernal Pool species. The aquatic resource survey was updated on January 17, 2022.

6.1 RIPARIAN/RIVERINE

6.1.1 Methods

A Riparian/Riverine and Vernal Pool habitat assessment was conducted by Mr. Hogenauer during a site visit on April 19, 2021 and was updated on January 17, 2022. The assessments were conducted concurrently in the field with the aquatic resources surveys on April 19, 2021, and January 17, 2022 (Section 3.0 above) and sensitive plant surveys on April 19 and May 27, 2021 (Section 7.0 below). The evaluation consisted of a directed search for field characteristics indicative of Riparian/Riverine habitats. Field indicators include the presence of certain plant species, drainage courses, drainage patterns, ponded water, changes in soil character, changes in vegetation character, and deposits of water-borne debris. The April 2021 visit consisted of a focused survey for Riparian/Riverine and Vernal Pool plant species, along with mapping potential Riparian/Riverine resources in the Study Area. The May 2021 visit consisted of a focused survey for sensitive plant species.

The MSHCP has a separate definition for "riparian" and for "riverine." Riverine features include those that are natural in origin as well as semi-natural features that have been modified and/or redirected and can include featured indirectly created through manipulation of the landscape, including channelization of a historic riverine feature. If these features connect to nearby downstream resources that are either existing or described conservation lands, they would be considered riverine. Riverine features are typically unvegetated or include vegetation similar to surrounding uplands. Riparian features are those with vegetation dependent upon a water source such as a stream, drainage, pond, or similar.

6.1.2 Existing Conditions and Results

Potential riverine habitat in the Study Area consists of a small unnamed ephemeral drainage. The drainage originates east of the Study Area as a natural drainage and is collected on site via a drainage pipe and conveyed across the Study Area via a combination of two culverts and surface flow, then back to the original drainage course.

The drainage consists of 0.048 acre and 423 linear feet of streambed, along with 0.01 acre and 35 linear feet of rip/rap at culvert outlets, and 0.005 acre and 198 linear feet of culvert (Table 9, *Existing Habitats Evaluated for Riparian/Riverine Potential*). The drainage connects to an unnamed off-site drainage that eventually connects to Canyon Lake approximately two miles to the west. The drainage occurs primarily within Riversidean sage scrub (including disturbed), and also travels under non-native woodland comprised of a few upland tree species consisting of Peruvian pepper and eucalyptus (*Eucalyptus* sp.).

The functions and services of the drainage are minimal, consisting of conveying small amounts of water and sediment, toxin, and nutrient trapping. Riparian habitat does not occur in the Study Area.

Table 9
EXISTING HABITATS EVALUATED FOR RIPARIAN/RIVERINE POTENTIAL

Resource Type	Acre[1]	Linear Feet
Riverine-Ephemeral Streambed	0.048	423
Rip/Rap	0.01	35
Culvert	0.005	198
Total	**0.068**	**656**

[1] Acreage rounded to nearest 0.001 for full disclosure due to small size of resources.

6.1.3 Impacts

The drainage is the only water feature in the Study Area that qualifies as MSHCP Riparian/Riverine resources. This determination was based on the natural origin of the drainage. The Project proposes permanent impacts to 0.042 acre streambed, along with 0.01 acre rip/rap, and 0.005 acre culvert. The impacts are related to the grading for the new tank, water quality basin, and associated infrastructure (Table 10).

Table 10
MSHCP RIPARIAN/RIVERINE IMPACTS

Habitat Type	Acres*	Linear Feet
Riverine-Ephemeral Streambed	0.042	385
Rip/Rap	0.01	35
Culvert	0.005	83
Totals*	**0.057**	**503**

*Impacts are show to the nearest 0.001 acre due to the small size of the impacts.

6.1.4 Mitigation

Permanent impacts to 0.042 acre and 385 linear feet of ephemeral stream are proposed to be mitigated at a 2:1 ratio, with a minimum 1:1 establishment/re-establishment component. Because the remaining 0.006 acre of ephemeral streambed on site, that would remain unimpacted, would not be placed in long-term conservation, this acreage is required to be included in the mitigation acreage. The result is a total mitigation purchase of 0.096 acre of re-establishment and/or rehabilitation credits from the Riverpark Mitigation Bank or an alternative method approved by the CDFW and RWQCB. The impacts to rip/rap and culvert will be replaced on site as part of the Project design. (Table 11, *MSCHP Mitigation*).

Table 11
MSHCP MITIGATION

Habitat Type	Acres	Ratio	Mitigation
Riverine-Ephemeral Streambed	0.048	2:1	0.096
Totals	**0.048**		**0.096**

6.2 VERNAL POOLS

6.2.1 Methods

The Study Area was surveyed by Mr. Hogenauer on April 19, 2021 and January 17, 2022, for signs of vernal pool, ephemeral ponds, or similar habitat. Vernal pool indicators searched for include standing water, cracked soil, presence of certain plant species, and changes in soil or vegetation characteristics. Soils information was gathered from the U.S. Department of Agriculture online database (USDA 2021).

6.2.2 Existing Conditions and Results

The vernal pool assessment revealed that the Study Area does not have potential vernal pools or similar temporary ponded features such as road rut, or ephemeral pools. The soils in the study area are also highly disturbed from the previous construction activities related to the building of the first two tanks and associated infrastructure that are part of the existing facility.

6.2.3 Impacts

The Project will not result in impacts to vernal pools as no vernal pools occur within the Study Area.

6.3 FAIRY SHRIMP

No potential fairy shrimp habitat occurs in the Study Area. Fairy shrimp require vernal pools or similar ponded features such as road ruts, and vernal swales; and generally found in vernal pool complexes that are typically hydrologically connected. Based on the above details the Study Area does not include features with the potential to support fairy shrimp. Additionally, the topography and hydrology of the Study Area suggest that there is limited potential for potential habitat to support a suitable hydroperiod for a fairy shrimp life span.

6.3.1 Impacts

The Project will not result in impacts to fairy shrimp as potential habitat for fairy shrimp does not occur in the Study Area.

6.4 RIPARIAN BIRDS

6.4.1 Methods

The vegetation in the Study Area was mapped and assessed during site visits in April and May. The on-site Study Area was determined not to include habitat with the potential to support riparian bird species (including least Bell's vireo [LBVI], southwestern willow flycatcher [SWFL; *Empidonax traillii extimus*], or yellow-billed cuckoo [YBCU; *Coccyzus americanus*]). Habitats on-site primarily consist of Riversidean sage scrub, non-native grassland, and non-native woodland. The non-native woodland consists of Peruvian pepper and eucalyptus. The aforementioned riparian bird species utilize willow riparian or similar woodland or forest habitats that are layered. The preferred habitat for the riparian bird species does not occur in the Study Area.

Other MSHCP riparian bird species are bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*). These species primarily occur adjacent to open water habitats, with the peregrine falcon possibly occurring in riparian woodland and forest habitats. Suitable nesting habitat for these species does not occur in the Study Area.

6.4.2 Impacts

The Study Area does not include habitat with the potential to support MSHCP riparian birds. No impacts are proposed to occur to riparian bird habitat; therefore, no surveys or mitigation is required.

6.5 PLANTS

6.5.1 Plants

The MSHCP lists 23 sensitive plant species that have the potential to occur in Riparian/Riverine and Vernal Pool habitats. These species are:

- California black walnut (*Juglans californica* var. *californica*),
- Engelmann oak (*Quercus engelmannii*),
- Coulter's matilija poppy (*Romneya coulteri*),
- San Miguel savory (*Clinopodium chandleri*),
- spreading navarretia (*Navarretia fossalis*),
- graceful tarplant (*Holocarpha virgata* ssp. *elongata*),
- California Orcutt grass (*Orcuttia californica*),
- prostrate navarretia (*Navarretia prostrata*),
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*),

- Orcutt's brodiaea (*Brodiaea orcuttii*),
- thread-leaved brodiaea (*Brodiaea filifolia*),
- Fish's milkwort (*Polygala cornuta* var. *fishiae*),
- lemon lily (*Lilium parryi*),
- San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*),
- ocellated Humboldt lily (*L. humboldtii ssp. ocellatum*),
- Mojave tarplant (*Deinandra mohavensis*),
- vernal barley (*Hordeum intercedens*),
- Parish's meadowfoam (*Limnanthes gracilis* var. *parishii*),
- slender-horned spineflower (*Dodecahema leptoceras*),
- Santa Ana River woolly-star (*Eriastrum densifolium* ssp. *sanctorum*),
- Brand's phacelia (*Phacelia stellaris*),
- mud nama (*Nama stenocarpum*), and
- smooth tarplant (*Centromadia pungens* ssp. *laevis*)

6.5.2 Methods

A focused plant survey of the Study Area was conducted on April 19 and May 27, 2021, by HELIX biologist Rob Hogenauer. The surveys included searching for the Riparian/Riverine plant species listed above and in Section 6.1.2 of the MSHCP. Mr. Hogenauer walked the entire Study Area searching for sensitive plants, including MSHCP Riparian/Riverine species.

6.5.3 Results

The Study Area has limited habitat with the potential to support Riparian/Riverine and Vernal pool plant species. The plant species associated with Riparian/Riverine and Vernal Pool areas were confirmed to be absent from the Study Area. A number of the species, including California Orcutt grass, spreading navarretia, thread-leaved brodiaea, San Miguel savory, graceful tarplant, prostrate navarretia, San Diego button-celery, Orcutt's brodiaea, Fish's milkwort, lemon lily, San Jacinto Valley crownscale, Mojave tarplant, Brand's phacelia, Santa Ana River woolly-star, vernal barley, and Parish's meadowfoam, occur in habitats that do not occur in the Study Area (e.g., vernal pools) or have distributions well outside of the Study Area. The remaining species have a distribution that includes the Study Area or occur in habitats found in the Study Area and are discussed in greater detail below.

Engelmann oak is a conspicuous tree species associated with alluvial fans and slopes with a mesic aspect. Coast live oak trees occur in the Study Area. No Engelmann oaks were observed and are presumed to be absent from the Study Area.

Mud nama is restricted to muddy embankments of marshes and swamps, and within lake margins and riverbanks (CNPS 2016). Three populations are known from Riverside County, with two occurring along the San Jacinto River (Dudek 2003). This species was not observed and is presumed to be absent from the Study Area.

Smooth tarplant is found in southwestern California and northwestern Baja California, Mexico (Baja), and occurs in San Bernardino, Riverside, and San Diego counties. This species occurs in open spaces within a variety of habitats, including alkali scrub and playas, riparian woodland, watercourses, and grasslands with alkaline affinities (Dudek 2003; CNPS 2016). This species was assessed as having a low potential to occur but was not observed and is presumed to be absent from the Study Area.

Coulter's Matilija poppy occurs in dry washes and canyons below 3,600 feet. It often occurs within sage scrub and chaparral habitats. Dense shrub cover may limit the expansion of this species (Dudek 2003). This species is easily detected when present. It was not observed and is presumed absent from the Study Area.

Ocellated Humboldt lily is associated with riparian corridors in coniferous forest and chaparral habitats. Within Western Riverside County, ocellated Humboldt lily is restricted to canyons along the east slope of the Santa Ana Mountains and the north slope of the Palomar Mountains. The riparian habitat on site is not associated with coniferous forest. This species was not observed and is presumed to be absent from the Study Area.

Slender-horned spineflower is typically found in mature alluvial scrub with sandy soils but is also found in rocky soils and open chamise chaparral. Ideal habitat is thought to be benches or terraces that receive overbank flow every 50 to 100 years. Habitat for this species does not occur on the Study Area. This species was not observed and is presumed to be absent from the Study Area.

None of the 23 MSHCP Riparian/Riverine and Vernal pool plant species were observed in the Study Area, and none are expected to occur within the Study Area. A list of plant species observed during the field surveys is provided as Appendix A.

6.6 EQUIVALENCY ANALYSIS

The project proposes 0.057 acre of permanent impacts to Riparian/Riverine habitat comprised of 0.042 acre Riverine drainage, 0.005 acre culvert, and 0.01 acre rip/rap (Table 10). The impact area and the adjacent habitat do not support MSHCP Riparian/Riverine birds or plant species. No impacts to vernal pool habitat are proposed. Based on these observations, mitigation is only required for impacts to Riparian/Riverine habitat.

The proposed impacts do not occur within land proposed to be conserved under the MSHCP. The project does occur immediately north of Public Quasi Public (PQP) land that is owned by the Bureau of Land Management, but no impacts to the PQP land are proposed. The project impacts are proposed to occur within the limits of the existing facility and adjacent roadway.

The functions and values of the impacted resources will be reduced on site by placing a portion of the drainage into a culvert. The riverine habitat proposed for impact has minimal native vegetation. Credits purchased at the Riverpark Mitigation Bank, or another approved bank, will be for higher quality habitat than those resources being impacted (Table 11). The resources proposed for impact are subject to edge effects from the existing facility and residential development to the west. The Riverpark Mitigation Bank is located on 600 acres with minimal edge effects. Mitigation banks are subject to specific criteria for the initial restoration of the bank followed by long-term management plans to ensure the protection of the bank habitat. Banks are monitored by a long-term manager and resource agencies to ensure the protection documents are enforced.

6.7 OTHER SECTION 6.1.2 SPECIES

Section 6.1.2 of the MSHCP also includes the protection of fish and amphibian species.

6.7.1 Fish

The Santa Ana sucker is restricted to the Santa Ana River watershed with year-round flows. This species generally lives in small shallow streams less than seven meters wide with various current strengths. They require permanent streams with a gravel bottom preferred. They prefer cool, clear water but can tolerate turbid waters. Habitat for this species is not present in the Study Area; thus, this species is not expected to occur.

6.7.2 Amphibians

The MSHCP Section 6.1.2 includes the protection of three amphibian species, arroyo toad (*Anaxyrus californicus),* mountain yellow legged frog (*Rana muscosa*), and California red-legged frog (*Rana draytonii*). Arroyo toad occur in streams that have breeding pools that are shallow with minimal current. Requirements also include sandy banks with areas of minimal vegetative cover. The stream in the Study Area is ephemeral and only flows in response to direct rainfall. The ephemeral stream does not constitute habitat for arroyo toad, mountain yellow legged frog, or California red-legged frog. Mountain yellow-legged frog and California red-legged frog are not known to occur on or adjacent to the Study Area. The mountain yellow-legged frog occurs in mountain streams and is currently only known within the County in the San Jacinto Mountains. The California red-legged frog is only known within the County on the Santa Rosa Plateau. It requires deep water with adjacent uplands to move between breeding sites. Habitat for these species does not occur on the Study Area; thus, none of the MSHCP sensitive amphibian species are expected to occur.

7.0 PROTECTION OF NARROW ENDEMIC PLANT SPECIES (SECTION 6.1.3)

The Study Area is not located within an MSHCP Section 6.1.3 Narrow Endemic Plant Species Survey Area (NEPSSA).

7.1 METHODS

Although the Study Area is not within the MSCHP survey area for narrow endemic plants, a survey for sensitive plants was conducted. On April 19 and May 27, 2021, Mr. Hogenauer conducted a focused survey for potential sensitive plant species. Surveys were conducted by walking transects across the entire site to allow for 100 percent visual coverage of the Study Area. Most plants were identified in the field. Those plants unable to be identified to species in the field were keyed in the office to species. The survey method follows the guideline recommended by the CDFW (CDFW 2018).

7.2 RESULTS

The plant surveys conducted within the Project Study Area resulted in the observation of 34 plant species. None of the observed plants are NEPSSA or other sensitive plant species.

7.3 IMPACTS

NEPSSA or other sensitive plant species do not occur in the Study Area; therefore, no impacts to sensitive plant species are proposed.

8.0 ADDITIONAL SURVEY NEEDS AND PROCEDURES (SECTION 6.3.2)

MSHCP Section 6.3.2 Additional Survey Needs and Procedures includes survey areas for plants, amphibians, BUOW, and mammals. These items are discussed below as they apply to the Study Area.

8.1 CRITERIA AREA PLANT SPECIES

The Study Area is not within a Criteria Area Plant Species Survey Area. A general sensitive plant survey was conducted as detailed in Section 7 above.

8.2 AMPHIBIANS

The Study Area is not within an amphibian survey area. No surveys for amphibians are required, and none were conducted.

8.3 BURROWING OWL

The Study Area is within the mapped survey area for BUOW, and surveys were conducted.

8.3.1 Methods

The Study Area is located within an MSHCP BUOW Survey Area; thus, MSHCP protocol surveys for BUOW are required. In accordance with the County's survey protocol, a Step I-Habitat Assessment for BUOW was conducted by Mr. Hogenauer on April 19, 2021, during which suitable habitat for BUOW was observed. The Habitat Assessment included the Study Area and a 150-meter (approximately 500-foot) buffer zone surrounding the periphery of the Study Area (survey area; County 2006).

After completing the habitat assessment and in accordance with the survey protocol, Step II surveys were conducted (Table 12, *Burrowing Owl Survey Information*). Step II surveys typically consist of a focused burrow survey (Part A) and four focused BUOW surveys (Part B) to determine whether the survey area supports suitable burrows and/or BUOWs. The habitat assessment and focused burrow survey were conducted concurrently with the first focused BUOW survey. The majority of the Study Area includes greater than 50 percent shrub cover or is comprised of developed land. The Study Area has 0.44 acre of non-native grassland and 0.87 acre of disturbed habitat that were initially accessed as having the potential to support BUOW. During the survey on April 19, 2021, no burrows with the potential to support BUOW were observed in the Study Area. The disturbed habitat is regularly disturbed/disked as part of the existing facility maintenance. The lack of burrows and location and regular activity at the habitats results in the Study Area not having the potential to support BUOW.

A second burrow survey was conducted on May 27 concurrently with the sensitive plant survey. No potential burrows were observed on May 27, confirming the lack of potential BUOW burrows.

Table 12
BURROWING OWL SURVEY INFORMATION

Date	Time	Conditions	Results
4/19/21	0720-0920	Start: clear, 55° F, wind 1-3 mph End: clear, 68° F, wind 0-2 mph	No burrows with potential to support burrowing owl
5/27/21	Burrow search	NA	No burrows with potential to support burrowing owl

8.3.2 Results

The Study Area includes minimal habitat that met most of the basic requirements of burrowing habitat; however, the Study Area lacks burrows with the potential to support BUOW. No BUOW or sign of BUOW occupation was observed during the survey.

8.3.3 Impacts

Although the Study Area currently lacks potential BUOW habitat, there is potential for California ground squirrels (*Otospermophilus beecheyi*) or other ground-dwelling mammals to create burrows. As such, there is a low potential for significant impacts to BUOW.

8.3.4 Mitigation

The Study Area does have habitat with low potential to support BUOW, except it lacks potential burrows. Due to the potential for California ground squirrels (*Otospermophilus beecheyi*), or other ground-dwelling mammals to create burrows, a pre-construction survey is required prior to Project initiation to ensure impacts to BUOW are avoided. Within 30 days prior to initiating ground-disturbance activities, the Project Proponent shall retain a qualified biologist to complete a pre-construction avoidance survey, in accordance with the MSHCP guidelines. If the pre-construction survey is negative and BUOW is confirmed absent, then ground-disturbing activities shall be allowed to commence, and no further mitigation would be required.

The Study Area has very low potential to be used by BUOW. However, if one or more BUOW are observed in the Study Area during the pre-construction survey, the Project is required to avoid impacts to BUOW. Project Proponent shall immediately inform the County, RCA, and the wildlife agencies (CDFW and USFWS) of the presence of a BUOW within the Study Area. No disturbance should occur within 300 feet of an active burrow during the breeding season (March 1 through August 31) except for the purpose of relocation according to an approved BUOW Protection and Relocation Plan. No disturbance should occur within 150 feet of an active BUOW burrow during the non-breeding season (September 1 through February 28). Due to the small size of the Study Area total avoidance of an active BUOW burrow is not feasible. Preparation of a BUOW Protection and Relocation Plan, to be approved by the RCA and/or the wildlife agencies, would be required. The plan would also require notification and approval of the State banding permit office and Federal MBTA office if active relocation is needed. This plan would include details of a BUOW capture and relocation to include monitoring of the relocated BUOW. The preferred timing for BUOW relocation is early in the breeding season, prior to the laying of eggs.

In addition to the BUOW Protection and Relocation Plan, a Determination of Biologically Equivalent or Superior Preservation (DBESP) would be required for compliance with the MSHCP. Addressing BUOW impacts generally requires extensive coordination.

These measures would reduce potential impacts to less than significant.

8.4 MAMMALS

The Study Area is not within a survey area for mammals. No mammal surveys are required, and none were conducted.

9.0 INFORMATION ON OTHER SPECIES

9.1 SPECIES NOT ADEQUATELY CONSERVED

The MSHCP includes a table (MSHCP Table 9-3) of 28 species not adequately conserved under the MSHCP. These species were not observed on the property during the various site visits conducted on the property.

9.2 SPECIAL STATUS PLANT SPECIES

Special status plant species have been afforded special status and/or recognition by the USFWS and/or CDFW. They may also be included in the CNPS' Inventory of Rare and Endangered Plants. Their status is often based on one or more of three distributional attributes: geographic range, habitat specificity, and/or population size. Sensitive species are those considered unusual or limited in that they are: (1) only found in the region; (2) a local representative of a species or association of species not otherwise found in the region; or (3) severely depleted within their ranges or within the region. No sensitive plant species were observed in the Study Area.

A total of 64 plant species were evaluated for their potential to occur in the Study Area (Appendix C). A few of these species are known to occur within one mile of the Study Area (Figure 11, *Coastal California Gnatcatcher Critical Habitat and Observations*). Only 24 of the evaluated species have appropriate habitat within the Study Area. None of the species were observed during the sensitive plant survey. The 64 plant species evaluated are all presumed absent or do not have the potential to occur in the Study Area (Appendix C). An explanation of status codes is included as Appendix E, *Explanation of Status Codes for Plant and Animal Species*. No additional plant species have a high potential to occur based on geographic range, elevation range, and/or lack of suitable habitat in the Study Area.

Eight of the species evaluated are listed at either the federal or state level, with four of the eight listed at both the federal and state level. Three of the listed species have low potential to occur but were not observed and are presumed absent from the Study Area. They are the federal and state endangered slender-horned spineflower (*Dodecahema leptoceras*), federal endangered and state threatened Munz's onion (*Allium munzii*), and federal endangered San Diego Ambrosia (*Ambrosia pumila*).

An additional sixteen sensitive (but not listed) species also have potential to occur in the Study Area but were determined to be absent by conducting of the sensitive plant surveys. They are rainbow manzanita (*Arctostaphylos rainbowensis*), Jaeger's milk vetch (*Astragalus pachypus* var. *jaegeri*), Catalina mariposa lily (*Calochortus catalinae*), Plummer's mariposa lily (*Calochortus plummerae*), Intermediate mariposa lily (*Calochortus weedii intermedius*), Payson's jewel flower (*Caulanthus simulans*), Parry's spineflower (*Chorizanthe parryi* var. *parryi*), long-spined spineflower (*Chorizanthe polygonoides longispina*), San Miquel savory (*Clinopodium chandleri*), paniculate tarplant (*Deinandra paniculata*), many-stemmed

Source: Aerial (Maxar, 2021)

HELIX Environmental Planning

Coastal California Gnatcatcher Critical Habitat and Observations

Figure 11

dudleya (*Dudleya multicaulis*), graceful tarplant (*Holocarpha virgata ssp. elongata*), vernal barley (*Hordeum intercedens*), mesa Horkelia (*Horkelia cuneata* var. *puberula*), southern California black walnut (*Juglans californica*), and Robinson's pepper-grass (*Lepidium virginicum var. robinsonii).*

9.3 SPECIAL STATUS ANIMAL SPECIES

Special status animal species include those that have been afforded special status and/or recognition by the USFWS and/or CDFW. In general, the principal reason an individual taxon (species or subspecies) is given such recognition is the documented or perceived decline or limitations of its population size or geographical extent and/or distribution, resulting in most cases from habitat loss.

Two special status animal species were observed within or adjacent to the Study Area during the 2021 biological surveys. The two special status animal species known to occur within the Study Area and listed below. Status codes are defined in Appendix E.

Coastal California gnatcatcher (*Polioptila californica californica*)
Status: FE, SSC
Distribution: Observed throughout much of southern California.
Habitat(s): Sage scrub
Status on site: Two Pairs observed in Study Area. One pair was observed foraging along the existing tank access road. The second pair was observed nesting about 130 feet west of the large tank and 40 feet north of the existing access road. Both species were observed foraging on both sides of the existing tank access road (Attachment F). Suitable sage scrub habitat is scattered in the Study Area, but the two pairs were observed in the sage scrub with the least disturbance and highest shrub density.

Bell's sparrow (*Artemisiospiza belli*)
Status: --/WL
Distribution: A year-round resident in the coastal ranges of California into Baja California.
Habitat(s): occurs in semi-open habitats with evenly spaced shrubs one to two meters high. Generally associated with sage scrub habitats.
Status on site: Several individuals were observed (at separate times) foraging on the ground between shrubs on the south side of the existing access road, west of the large tank. (Figure 12).

Special status animal species that were not observed or otherwise detected but assessed as to their potential to occur on site, are included in Appendix D, *Special Status Animal Species Potential to Occur*. The species are grouped into invertebrates and vertebrates (insects, amphibians and reptiles, birds, and mammals) and alphabetized by scientific name. An explanation of status codes is included as Appendix E, *Explanation of Status Codes for Plant and Animal Species*. A total of 52 species were assessed for their potential to occur. A few of the species are known to occur within one mile of the Study Area (Figure 11).

Two of the species, coastal California gnatcatcher and Bell's sparrow, were observed in the Study Area as discussed above. None of the other species analyzed have a high potential to occur within the Project site based on geographic range, elevation range, lack of suitable habitat, and the lack of observation. Two special status species are known from the local area but are not expected to occur within the Project site itself due to lack of suitable habitat: BUOW and San Bernardino kangaroo rat (*Dipodomys merriami parvus*).

BUOW habitat was determined not to occur in the Study Area. The 2021 habitat assessment showed that a portion of the site has dense shrub cover and the areas with less than 50 percent shrub cover lacked potential burrows. BUOW were not detected using the Study Area during the habitat assessment or during the additional site visits for sensitive plant surveys and CAGN focused surveys.

San Bernardino kangaroo rat (*Dipodomys merriami parvus)* and sign of the species (e.g., potential burrows, tail drags, suitable substrate) was not detected during the 2021 HELIX surveys. No portions of the Project site support suitable habitat for the species due to existing developments and land uses, and rocky soils. Typical habitat for the species includes sandy soils that are lacking from the Study Area. The eastern portion of the Study Area has dense sage scrub and development of the existing water tanks. The central and western portions of the Study Area include open sage scrub and grasslands, but also rocky soils and are disturbed from the development of the water tanks. The southern extension of the Study Area is primarily along a disturbed trail with adjacent open sage scrub on rocky soils. The combination of disturbances and rocky soils results in a lack of habitat for the San Bernadino kangaroo rat.

HELIX inspected the Study Area for the presence or absence of the Primary Constituent Elements (PCE; the physical and biological features that are essential to the conservation of the subspecies) required for this species. Alluvial fans, washes, and associated floodplain habitat, consisting of predominantly sandy soils with open sage scrub habitat, do not occur within the Study Area. Additionally, suitable upland areas adjacent to alluvial fan habitat with sandy soils and open sage scrub that provide foraging or repopulation opportunities do not occur within the Project site. This species prefers burrowing and foraging in soils deposited by alluvial processes, which are not found in the Study Area.

No other species have a high potential to occur based on geographic range, elevation range, and/or lack of suitable habitat in the Project site. There are three species with a moderate potential to occur in the Study Area. They are coastal western whiptail (*Aspidoscelis tigris stenjnegeri)*, southern California rufous-crowned sparrow (*Aimophila ruficeps canescens)*, and San Diego black-tailed jack rabbit (Lepus californicus). All three are California state species of concern and are locally common.

There are nine species with low potential to occur in the Study Area, including one insect, four reptiles, and four birds. Six of these species are California state species of concern, two are CDFW watch list species, and one (Crotch's bumble bee [*Bombus crotchii*]) is a candidate for being listed as endangered under the California Endangered Species Act (CESA).

Crotch's bumble bee has a state ranking of S1/S2 which means the species is considered critically imperiled is extremely rare. Literature from CDFW indicates that the species overwinters in soft soils, or under leaf litter or other debris. Soft soils and leaf litter are lacking in the Study Area (CDFW 2019). The majority of the soils are rocky and hard and not typical of the soils used in overwintering by the species. Crotch's bumble bee nest underground may rely on sufficient availability of rodents and other animal burrows to provide potential nesting sites (CDFW 2019). The Study Area lacks an abundance of burrows due to the rocky soils. Based on this information, there is low potential for Crotch's bumblebee to forage in the Study Area, and they are not expected to overwinter or nest in the Study Area.

9.3.1 Coastal California Gnatcatcher

A U.S. Fish and Wildlife Service protocol coastal California gnatcatcher (CAGN) survey was conducted by biologist Garrett Huffman (Permit TE-778195-14) between May 6 and June 6, 2021. The surveys were conducted by walking within and along the perimeter of suitable CAGN habitat present within the Project site. The survey route was arranged to ensure complete survey coverage of habitat with potential for occupancy by CAGN. Surveys were conducted with binoculars to aid in bird detection. Recorded CAGN vocalizations were played sparingly and only if other means of detection had failed. If a CAGN was detected before playing recorded vocalizations, the recordings were not played. Once CAGNs were initially detected in an area, the use of playback was discontinued. Survey dates and times are shown in Table 13, *Survey Information*, and complete survey details are included in the full survey report (Appendix F).

Table 13
SURVEY INFORMATION

Site Visit	Survey Date	Biologist(s)	Start/Stop Time	Approx. Acres Surveyed/ Acres per Hour	Start/Stop Weather Conditions
1	05/06/21	Garrett Huffman[1]	10:00 / 11:30	2.99 ac/ 1.9 ac/hr	65°F, wind 0-2 mph, 0% cloud cover 71°F, wind 0-2 mph, 0% cloud cover
2	05/13/21	Garrett Huffman[12]	09:00 / 10:30	2.99 ac/ 1.9 ac/hr	71°F, wind 1-4 mph, 0% cloud cover 75°F, wind 1-4 mph, 0% cloud cover
3	05/20/21	Garrett Huffman[1]	10:00 / 11:00	2.99 ac/ 2.99 ac/hr	65°F, wind 3-6 mph, 60% cloud cover 68°F, wind 2-8 mph, 40% cloud cover
4	05/27/21	Garrett Huffman[1] Rob Hogenaur[2]	10:30 / 12:00	2.99 ac/ 1.9 ac/hr	62°F, wind 0-3 mph, 0% cloud cover 70°F, wind 2-6 mph, 0% cloud cover
5	06/03/21	Garrett Huffman[1] Alexander Walsh[2]	09:30 / 12:00	2.99 ac/ 1.2 ac/hr	75°F, wind 2-5 mph, 0% cloud cover 85°F, wind 2-6 mph, 0% cloud cover
6	06/10/21	Garrett Huffman[1] Alexander Walsh[2]	09:30 / 12:00	2.99 ac/ 1.2 ac/hr	65°F, wind 3-6 mph, 60% cloud cover 68°F, wind 2-8 mph, 40% cloud cover

[1] USFWS Permit 20186A-2
[2] Supervised Individual

A total of two pairs of CAGN were detected during the survey effort, although not all individuals were detected during each survey (Figure 11). One CAGN pair (Pair No. 1) was detected foraging and periodically vocalizing in the northeastern portion of the Project site along the slopes of a natural drainage after eliciting a response with audio playback.

A second pair (Pair No. 2) was detected approximately 150 feet south of where Pair No. 1 was detected. Pair No. 1 was seen engaging in territorial behavioral display and vocalization with Pair No. 2. Pair No. 1 was heard vocalizing just outside of the survey area near an existing water tank to the southeast. Pair No. 1 was observed during surveys 1, 2, 3, and 5.

During survey 4, an active nest belonging to Pair No. 2 was detected in a California buckwheat bush along the western portion of the Project site, towards the base of a sloped natural drainage (see Figure 11). The breeding Pair No. 2 was observed taking turns incubating the nest approximately every 20 minutes. The active nest had been incubated for a period of 14 days at the end of survey 6. Pair No. 2 was observed during surveys 2, 4, 5, and 6.

The Project is applying to be a PSE under the MSCHP. The MSHCP is the Section 10(a) permit that covers impacts to CAGN. No mitigation other than compliance with the MSCHP as a PSE is required.

Additionally, the nesting locations observed during the focus survey are outside the proposed impact area.

9.3.2 Nesting Birds

In addition to the above sensitive animal species, nesting birds are protected under the Migratory Bird Treaty Act (MBTA) and under the CDFW code. The MBTA is interpreted as protecting nesting birds from direct impacts while the CDFW code protects nests from direct and indirect impacts.

Habitat both within and adjacent to the Project site could provide suitable nesting habitat for numerous bird species known to the region. An active CAGN nest was observed in the Study Area as discussed in Sections 5.3 and 6.2.1. Several additional species of bird were observed that have the potential to nest in the Study Area.

Two raptor species were observed in flight in the Study Area during the general biological survey and rare plant surveys (red-tailed hawk [*Buteo jamaicensis*] and American kestrel [*Falco sparverius*]) and several others have the potential to forage in the Project vicinity. The Project site does not provide high-quality raptor nesting habitat due to the limited number of trees, residential, and utility uses. Extensive raptor foraging habitat occurs off site in the Project vicinity in the rolling hills in the Quail Valley and adjacent to Canyon Lake. To avoid impacts to nesting birds, vegetation should be cleared between September 1 and February 14. If vegetation is to be cleared during the bird nesting season (February 15 through August 31), a nesting bird survey will be required. If an active nest is detected, it shall be avoided and an appropriate buffer established until the nest is determined by the biologist to no longer be active. Standard buffers distances are 100 feet for common songbirds, 300 feet for sensitive bird species, and 500 feet for raptors and listed bird species.

10.0 GUIDELINES PERTAINING TO THE URBAN/WILDLANDS INTERFACE (SECTION 6.1.4)

Section 6.1.4 of the MSHCP addresses potential indirect impacts to MSHCP Conservation Areas via the Urban/Wildlands Interface Guidelines (UWIG). The Project occurs adjacent to PQP land. PQP land is conserved land and occurs adjacent to the eastern side of the Study Area. Additional PQP land occurs approximately 3,000 feet northwest and 6,000 feet southeast of the Study Area. The Project's compliance with the UWIG guidelines is discussed below to demonstrate avoidance and minimization of potential indirect effects to these riverine resources.

10.1 DRAINAGE

The drainage in the Study Area drains away from the adjacent PQP lands. The Study Area drains to the southwest and via several unnamed drainages eventually reaches Canyon Lake. The Project includes a water quality basin at the western end of the existing drainage. All on-site flows from the Project and the existing drainage will enter the basin prior to continuing into the natural drainage off site to the west. No surface runoff from developed and paved areas would directly enter the on-site riverine resources and there would be no adverse increase in the amount of runoff entering these areas as a result of the proposed Project. Regular maintenance of the facilities would occur to ensure effective operation.

10.2 TOXICS

The Project does not require the use of chemicals and would not generate excessive bio-products such as oil from roads and cars that are potentially toxic or that may adversely affect wildlife species, habitat, or water quality. All Project runoff will be directed to an on-site water quality basin. In the event of high storm flows, the basin overflow is being directed to the existing unnamed drainage west of the Study Area. The Project will incorporate measures to prevent runoff from entering the drainage during construction. The Project will implement best management practices (BMPs). These measures will include:

- Use of drip pans under equipment being maintained or parked overnight.
- No storage of petroleum products, chemicals, or similar pollutants within 50 feet of a drainage.
- No use of equipment in drainage when flows are present.
- Concrete washout stations will be employed.
- No direct untreated discharges adjacent to, or directly into drainages.

10.3 LIGHTING

The Project would not require nighttime lighting. Additionally, the proposed Tank III is separated from the adjacent PQP land by the existing large tank on the facility. No impacts from lighting would occur.

10.4 NOISE

The Project would occur adjacent to undeveloped land occupied by sensitive species, including MSHCP covered species, which could be affected by noise during breeding activities. Potential adverse indirect effects on nesting birds from construction noise would be prevented through the implementation of BIO-3; the Project does not propose to introduce an increase in noise. The Project proposes to add a third water tank to a facility that already includes two active water tanks. Potential operation effects are not anticipated as the Project would be unmanned, and no noise-generating elements are proposed.

10.5 INVASIVES

UWIG includes a list of Invasive plants that should be avoided in landscaping for projects adjacent to MSHCP conservation area. It is recommended that all projects avoid the use of invasive plant species, specifically those listed in Table 6-2 of the MSHCP. The Project shall not use invasive plants for erosion control, landscaping, windrows, or other purposes.

10.6 BARRIERS

The Project's water tank and associated access road would not preclude wildlife from moving through the local area unimpeded. The facility operation includes occasional maintenance but not full-time human presence. Impacts would be less than significant.

10.7 GRADING/LAND DEVELOPMENT

The Project grading will be restricted to a narrow footprint. Impacts to the adjacent PQP land will be limited to those within the ROW for upgrading the existing pipeline.

11.0 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

11.1 SENSITIVE WILDLIFE

The Project will demonstrate compliance with the MSHCP through the implementation of mitigation measures BIO-1 and BIO-2. Potential impacts to the federally threatened coastal California gnatcatcher and State Watch List species Bells sparrow are covered under the MSHCP, with no species-specific mitigation requirements.

BIO-1 **MSHCP Mitigation Impact Fee.** Prior to construction, the Applicant will pay the appropriate MSHCP mitigation fee in accordance with Section 6.1.6 of the MSHCP for Participating Special Entities or take other such actions as agreed upon in coordination with the Western Riverside County Regional Conservation Authority (RCA) and the Wildlife Agencies. The fees shall be either collected by, or submitted to, the RCA.

BIO-2 **Pre-construction Burrowing Owl Survey.** A 30-day pre-construction survey for burrowing owls is required prior to initial ground-disturbing activities (e.g., vegetation clearing, clearing, and grubbing, grading, tree removal, site watering, equipment staging) to ensure that no owls have colonized the site in the days or weeks preceding the ground-disturbing activities. If burrowing owls have colonized the project site prior to the initiation of ground-disturbing activities, the project proponent will immediately inform the Regional Conservation Authority (RCA) and the Wildlife Agencies and will need to coordinate further with RCA and the Wildlife Agencies, including the possibility of preparing a Burrowing Owl Protection and Relocation Plan, prior to initiating ground disturbance. If ground-disturbing activities occur, but the site is left undisturbed for more than 30 days, a pre-construction survey will again be necessary to ensure that burrowing owl have not colonized the site since it was last disturbed.

11.2 NESTING BIRDS

The Implementation of mitigation measures BIO-2 and BIO-3 would ensure that potential impacts to birds protected under the MBTA and CFG Code are avoided during Project construction.

BIO-3 **Pre-Construction Nesting Bird Survey and Avoidance.** Vegetation clearing should be conducted outside the nesting season, which is generally defined as January 15 to August 31. If vegetation clearing must take place during the nesting season, a qualified biologist shall be retained to perform a pre-construction survey for nesting birds. A pre-construction nesting bird survey would not be required unless direct impacts to vegetation are proposed to occur. The nesting bird survey shall occur no more than seven days prior to vegetation removal.

Additionally, raptors (birds of prey) are known to begin nest building in January or February. If vegetation clearing is to occur between January 1 and February 15, a nesting raptor survey will be conducted within the Project site, including a 500-foot buffer.

If active bird nests are confirmed to be present during the pre-construction survey, a buffer zone will be established by the biologist until a qualified biologist has verified that the young have fledged or the nest has otherwise become inactive.

11.3 AQUATIC RESOURCES

The Project will result in impacts to 0.02 acre non-wetland waters of the U.S. jurisdictional to USACE, 0.06 acre waters of the state jurisdictional to RWQCB, 0.06 acre of streambed jurisdictional to CDFW, and 0.06 acre MSHCP Section 6.1.2 Riverine resources. These impacts are proposed to be mitigated off site via the purchase of re-establishment and/or rehabilitation mitigation credits at Riverpark Mitigation Bank or through alternative off-site establishment/re-establishment, rehabilitation, enhancement, and/or preservation mitigation approved by the USACE, USFWS, RWQCB, CDFW, and/or RCA, as appropriate. In accordance with regional standards, the mitigation shall occur at a 2:1 ratio to include a minimum 1:1 establishment/re-establishment component to ensure no-net-loss of aquatic resources. With the implementation of this mitigation, the impact on aquatic resources would be less than significant, and the project would be consistent with MSHCP Section 6.1.2.

BIO-4: **Aquatic Resources Permitting and Mitigation.** Prior to Project activities occurring within jurisdictional aquatic resources, the Project proponent shall prepare for approval by the RCA, USFWS, and CDFW a Determination of Biologically Equivalent or Superior Preservation (DBESP) for impacts to MSHCP Section 6.1.2 riverine resources and shall also apply for and obtain the following regulatory permits and approvals from the USACE, RWQCB, and/or CDFW, as applicable:

- Clean Water Act Section 404 Permit;
- Clean Water Act Section 401 Water Quality Certification; and/or
- California Fish and Game Code Section 1602 Streambed Alteration Agreement.

The Project proponent shall mitigate impacts to jurisdictional aquatic resources off site at a 2:1 ratio to include a minimum 1:1 establishment/re-establishment component through the purchase of 0.06 acre of re-establishment credits and 0.06 acre of re-establishment or rehabilitation credits from the Riverpark Mitigation Bank, which is located within the MSHCP planning area and San Jacinto River watershed approximately 8.0 miles to the northeast of the impact site, unless otherwise required by the RCA, USFWS, USACE, RWQCB, and/or CDFW during Project permitting.

11.4 SENSITIVE VEGETATION

The Project has been designed to concentrate and reduce the impact footprint and amount of pavement to the smallest area necessary to construct the Project at the required elevations and with the required infrastructure and safe, operational access. An unavoidable impact on Riversidean sage scrub would occur and would be considered significant. The impact would be reduced to a less-than-significant level with the implementation of mitigation measures BIO-1. The Project proponent will pay the appropriate mitigation fee, or take other actions as agreed to by the RCA and Wildlife Agencies and demonstrate compliance with the MSHCP as a PSE.

The Project would incorporate standard BMPs to help ensure the protection of sensitive habitat during Project construction. Specific BMPs may include but would not necessarily be limited to maintaining the Project work areas free of trash and debris; employing appropriate standard spill prevention practices and clean-up materials; installing and maintaining sediment and erosion control measures; maintaining effective control of fugitive dust; and properly storing, handling, and disposing of toxins and pollutants, including waste materials.

Implementation of required BMPs in combination with mitigation measures BIO-1, BIO-4, and BIO-5 would ensure that construction activities are contained within the proposed work limits, and that potentially significant direct and indirect impacts on sensitive natural communities are reduced to less-than-significant levels.

BIO-5 **Biological Monitor.** Prior to construction, the EMWD shall retain a qualified biologist to monitor the clearing and/or grubbing activities. The biological monitor shall attend pre-construction meetings and be present during the removal of vegetation to ensure that the approved limits of disturbance are not exceeded and provide periodic monitoring of the impact area including, but not limited to, trenches, stockpiles, storage areas, and protective fencing. Before construction activities occur in areas containing sensitive biological resources, workers shall be educated by the biologist to recognize and avoid those areas that have been marked as sensitive biological resources.

BIO-6 **Temporary Construction Fencing.** Prior to construction, EMWD shall require environmentally sensitive areas that occur outside of the approved work limits are identified on construction plans. Temporary construction fencing shall be installed along the approved work limits under the direction of the qualified biological monitor. Fencing shall be maintained and remain in place through the duration of Project construction.

11.5 NON-NATIVE INVASIVE SPECIES RESTRICTIONS

In accordance with the MSHCP, no plant species on List 6.2 of the MSHCP shall be utilized on the site (including any hydroseed mix used for interim erosion control) for consistency with Section 6.1.4 of the MSHCP.

11.6 MULTIPLE SPECIES HABITAT CONSERVATION PLAN PARTICIPATING SPECIAL ENTITY FEE

EMWD is not a participating agency under the MSHCP but is seeking a PSE for the proposed Project due to the presence of the coastal California gnatcatcher within the Project site. Properties within the MSHCP plan area are subject to an MSHCP mitigation fee based on the recommendation of the RCA. Section 6.1.6 of the MSHCP requires that PSEs contribute through payment of a fee, based upon the type of proposed activity. For Regional Utility Projects that will be constructed to serve Development, such as major trunk lines, PSEs shall pay a fee in the amount of up to five percent of the total capital costs or take such other actions as may be agreed to by the RCA and the Wildlife Agencies. All fees shall be either collected by, or submitted to, the RCA. All obligations must be satisfied prior to impacts to Covered Species and their Habitats.

11.7 STEPHENS' KANGAROO RAT HCP FEE

The Project is also within the Stephens' kangaroo rat fee area and is subject to the Stephens' kangaroo rat fee of $500 per acre (County 1996).

12.0 REFERENCES

American Ornithological Society. 2020. AOS Checklist of North and Middle America Birds. Available at: http://checklist.americanornithology.org/taxa. Accessed June.

Bradley, R. D., L.K. Ammerman, R.J. Baker, L.C. Bradley, J.A. Cook, R.C. Dowler, C. Jones, D.J. Schmidly, F.B. Stangl Jr., R.A. Van Den Bussche, B. Wursig. 2014. Revised Checklist of North American Mammals North of Mexico, 2014. Museum of Texas Tech University Occasional Papers. 327:1-27

California Department of Fish and Wildlife (CDFW). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. March 20.

2021. California Natural Diversity Data Base (CNDDB). RareFind Database Program, Version 5. Accessed April 22.

California Native Plant Society (CNPS), Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Available at http://www.rareplants.cnps.org. [accessed 22 April 2021].

Dudek and Associates. 2003. Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Final MSHCP, Volume I. Prepared for the County of Riverside Transportation and Land Management Agency. Approved June 17.

Emmel, T.C. and J.F. Emmel. 1973. The Butterflies of Southern California. Natural History Museum of Los Angeles County, Science Series 26: 1-148.

Google Earth. 2021. Aerial imagery of the Quail Tank III Study Area, Aerial Imagery from December 2018. Available at: https://earth.google.com/web. Accessed May 5, 2021.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, 156 pp.

Regional Conservation Authority (RCA). 2021. Participating Species Entities. https://www.wrc-rca.org/about-rca/participating-special-entities/.

Riverside, County of (County). 2006. Burrowing owl survey instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area. Environmental Programs Department. Available at: https://www.rctlma.org/Portals/3/EPD/consultant/burrowing_owl_survey_instructions.pdf.

1996. Ordinance 663.10. An Ordinance of the County of Riverside Amending Ordinance 663 Establishing the Riverside County Stephens' Kangaroo Rat Habitat Conservation Plan, Plan Fee Assessment Area, and Setting Mitigation Fees.

Taggart, T.W. 2014. The Center for North American Herpetology (CNAH): The Academic Portal to North American Herpetology. Available at: http://www.cnah.org/. November 11.

U.S. Army Corps of Engineers (USACE). 2022. National Wetland Plant List online. https://wetland-plants.usace.army.mil/nwpl_static/v34/home/home.html. Accessed January 18.

U.S. Department of Agriculture (USDA). 2021. National Resource Conservation Service. Web Soil Survey online. Available at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed February 21.

U.S. Fish and Wildlife Service (USFWS). 2021a. Critical habitat mapping. GIS files provided by USFWS. Available at: https://ecos.fws.gov/ecp/report/table/critical-habitat.html. Accessed April 2021.

2021b. National Wetlands Inventory. Available at: https://www.fws.gov/wetlands/data/google-earth.html. Accessed April 18.

This page intentionally left blank

Appendix A

Plant Species Observed

Appendix A
Plant Species Observed

Family	Scientific Name	Common Name
ANGIOSPERMS – EUDICOTS		
Anacardiaceae	*Schinus molle**	Peruvian pepper tree
Asteraceae	*Artemisia californica*	California sagebrush
	*Centaurea melitensis**	tocalote
	Corethrogyne filaginifolia	sand aster
	Gutierrezia spp	Snakeweed, matchweed
	Helianthus annuus	Annual Sunflower
	Heterotheca grandiflora	telegraph weed
	Lasthenia californica	Goldfields
	*Oncosiphon piluliferum**	stinknet
Boraginaceae	*Amsinckia intermedia*	rancher's fiddleneck
Brassicaceae	*Hirschfeldia incana**	short-pod mustard
Convolvulaceae	*Calystegia macrostegia*	Morning glory
Cuscutaceae	*Cuscuta* sp.	Dodder
Euphorbiaceae	*Croton californicus*	California Croton
	Croton setiger	dove weed
	Euphorbia albomarginata	Rattlesnake weed
Fabaceae	*Acmispon glaber*	deerweed
	Lupinus bicolor	Miniature lupine
	Medicago polymorpha *	bur-clover
Geraniaceae	*Erodium cicutarium**	redstem filaree
Hydrophyllaceae	*Phacelia* sp.	Phacelia
Liliaceae	*Calochortus splendens*	Splendid Mariposa
Myrtaceae	*Eucalyptus sp.**	Eucalyptus
Nyctaginaceae	*Mirabilis laevis*	Desert wishbone-bush
Polygonaceae	*Eriogonum fasciculatum*	buckwheat
ANGIOSPERMS – MONOCOTS		
Iridaceae	*Sisyrinchium bellum*	Blue eyed grass
Liliaceae	*Dichelostemma capitatum*	blue dicks
Poaceae	*Avena* sp.*	oats
	*Bromus diandrus**	common ripgut grass
	*Bromus hordeaceus**	soft brome
	*Bromus madritensis**	foxtail chess
	*Festuca myuros**	fescue
	*Hordeum murinum**	mouse barley
Themidaceae	*Bloomeria crocea var. crocea*	golden star

* Non-native species

Appendix B

Animal Species Observed or Detected

Appendix B
Animal Species Observed or Detected

Taxon		Scientific Name†	Common Name
Order	Family		
INVERTEBRATES			
Hymenoptera	Apidae	*Apis* sp.	honey bee
Hymenopterans	Formicidae	*Pogonomyrmex californicus*	California harvester ant
Lepidoptera	Nymphalidae	*Vanessa cardui*	Painted Lady
	Lycaenidae	*Icaricia acmon*	Acmon Blue
VERTEBRATES			
Amphibians and Reptiles			
Squamata	Phrynosomatidae	*Uta stansburiana*	side-blotched lizard
Birds			
Accipitriformes	Accipitridae	*Buteo jamaicensis*	red-tailed hawk
Apodiformes	Trochilidae	*Calypte anna*	Anna's Hummingbird
Columbiformes	Columbidae	*Zenaida macroura*	Mourning Dove
Galliformes	Odontophoridae	*Callipepla californica*	California Quail
Falconiformes	Falconidae	*Falco sparverius*	American Kestrel
Passeriformes	Aegithalidae	*Psaltriparus minimus*	Bushtit
	Corvidae	*Corvus corax*	Common Raven
	Passerellidae	*Artemisiospiza belli*†	Bell's Sparrow†
		Melozone crissalis	California Towhee
	Polioptilidae	*Polioptila californica californica*†	Coastal California Gnatcatcher†
	Mimidae	*Mimus polyglottos*	Northern Mockingbird
	Fringillidae	*Haemorhous mexicanus*	House Finch
	Tyrannidae	*Sayornis saya*	Say's Phoebe
		Sayornis nigricans	Black Phoebe
Mammals			
Lagomorpha	Leporidae	*Sylvilagus audubonii*	desert cottontail
Carnivora	Canidae	*Canis latrans*	coyote

† Special Status Species

Appendix C

Rare Plant Species Potential to Occur

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Abronia villosa var. *aurita*	Chaparral sand-verbena	--/-- CRPR 1B.1	Annual herb. Grows on desert dunes and in sandy areas within coastal scrub, chaparral. Found along the coast from Ventura County south to San Diego County, and east to San Bernardino, Riverside, and Imperial Counties. Flowering period: March to September. Elevation: 245 to 5,250 feet (75 to 1,600 meters).	**None.** Suitable sand dune habitat for this species is not present on-site.
Allium marvinii	Yucaipa onion	--/-- CRPR 1B.2	Perennial herb. Associated with clay openings in chaparral or sage. Elevation range 2,493-3,494 ft. Flowering period Apr-May.	**None.** Species only known to occur in the Beaumont area of Riverside County. Sage scrub habitat does occur on site, but not clay soils.
Allium munzii	Munz's onion	FE/ST CRPR 1B.1	Perennial herb. Occurs on mesic or clay soils, in openings in native grassland, chaparral, cismontane woodland, coastal scrub, and pinyon and juniper woodland. Elevation range 970–3,510 ft. Flowering period Apr–Oct.	**Presumed absent.** Grassland and sage scrub habitats are present. Clay soils not mapped on site but potential for clay inclusions exist. Not detected during surveys.
Ambrosia pumila	San Diego Ambrosia	FE/-- CRPR 1B.1	Perennial herb. Occurs on sandy loam or clay, sometimes alkaline, soils within grasslands, dry drainages, stream floodplain terraces, and vernal pool margins. Also occurs on slopes, disturbed places, and in coastal sage scrub or chaparral. Found in Riverside and San Diego Counties. Flowering period: April to October. Elevation: 65 to 1,360 feet (20 to 415 meters).	**Presumed Absent.** Disturbed habitat and dry drainage present on-site; however, Species is a perennial herb and would have been detected during surveys if present. Species was not detected.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Almutaster pauciflorus	alkali marsh aster	--/-- CRPR 2B.2	Perennial herb. Most often associated with alkali sinks, wetlands, and riparian areas though has been found in more upland areas. Found in Riverside, San Bernardino, Inyo, and Kern Counties. Flowers period: June to October. Elevation: 790 to 2,620 feet (240 - 800 meters).	**None.** Study does have an ephemeral stream, but no appropriate riparian or wetland habitats occur.
Amsinckia douglasiana	Douglas' fiddleneck	--/-- CRPR 4.2	Annual herb. Found in valley grassland and cismontane woodland habitats. Known localities in southern Central California coast. Found in Kern, Monterey, Riverside, Santa Barbara, San Benito, San Luis Obispo, and Ventura Counties. Flowering period: March to May. Elevation: 0 to 6,360 feet (0 to 1,950 meters).	**None.** Valley grassland and cismontane woodlands do not occur in study area.
Arctostaphylos rainbowensis	Rainbow manzanita	--/-- CRPR 1B.1	Perennial shrub. Occurs among granitic outcrops within chaparral. Found in Riverside and San Diego Counties. Flowering period: December to March. Elevation: 670 to 2,200 feet (205 to 670 meters).	**Presumed absent.** Species is conspicuous and would have been observed during surveys if present.
Astragalus pachypus var. *jaegeri*	Jaeger's milk vetch	--/-- CRPR 1B.1	Perennial herb. Occurs among desert shrubs in sand and gravel, in Creosote Bush Scrub, Joshua Tree Woodland. Also occurs in cismontane woodlands, coastal sage scrub, grasslands, and sandy or rocky soils. Elevation: 2,953-3,937 ft. Flowering period: Apr - Jun.	**Presumed Absent.** Coastal sage scrub and rocky soils occur in study area. Species not observed during plant surveys.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Atriplex coronata var. *notatior*	San Jacinto Valley crownscale	FE/-- CRPR 1B.1	Annual herb. Occurs in playas, native grassland, vernal pools. Floodplains (seasonal wetlands) dominated by alkali scrub, alkali playas, vernal pools, and alkali grasslands. Alkaline areas in the San Jacinto River Valley. Elevation range 455–1,640 ft. Flowering period Apr–Aug.	**None.** Vernal pools, playas, and similar habitats do not occur in study area.
Atriplex parishii	Parish's brittlescale	--/-- CRPR 1B.1	Annual herb. Occurs on highly alkaline silty-clay soils in playas, vernal pools, and chenopod scrub. Elevation range 80–6,235 ft. Flowering period Jun–Oct.	**None.** Vernal pools, playas and appropriate soils do not occur in study area.
Atriplex serenana var. *davidsonii*	Davidson's saltscale	--/-- CRPR	Annual herb. Occurs on highly alkaline lowlands with saline soil in coastal bluff scrub and coastal scrub. Elevation range 30–655 ft. Flowering period Apr–Oct.	**None.** Alkaline lowlands not present in study area.
Ayenia compacta	California ayenia	--/-- CRPR 2B.3	Perennial herb or shrub. Occurs in rocky canyons and desert arroyos of the Mojavean and Sonoran deserts. Elevation range 328-3,806 ft. Flowering period Mar-Apr.	**None.** Rocky canyons are arroyos are not present in study area.
Brodiaea filifolia	Thread-leaved brodiaea	FT/CE CRPR 1B.1	Perennial bulbiferous herb. Occurs in openings on clay soils in chaparral cismontane woodland, coastal scrub, playas, native grassland, and vernal pools. Usually associated with annual grassland and vernal pools. Elevation range 80–3,675 ft. Flowering period Mar–Jun.	**None.** Although coastal scrub and grasslands occur in the study area they are not in a vernal pool or similar habitat.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Brodiaea orcuttii	Orcutt's brodiaea	--/-- CRPR 1B.1	Perennial bulbiferous herb. Occurs within closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and vernal pools. Prefers mesic or clay soils. Found in Riverside San Diego Counties. Flowering period: May to July. Elevation: 98 to 5,550 feet (30 to 1,692 meters).	**None.** Mesic habitat and clay soils do not occur in study area.
Brodiaea santarosae	Santa Rosa Basalt brodiaea	--/-- CRPR 1B.2	Perennial herb. Occurs within grasslands on basaltic soils. Found in Riverside and San Diego Counties. Flowering period: May to June. Elevation: 1,850 to 3,430 feet (565 to 1,045 meters).	**None.** Basaltic soils not present, grassland lands disturbed and mixed with sage scrub.
Calochortus catalinae	Catalina mariposa lily	--/-- CRPR 4.2	Perennial bulbiferous herb. Occurs in chaparral, cismontane woodland, coastal scrub, and native grassland. Elevation range 45–2,295 ft. Flowering period Feb–Jun.	**Presumed absent.** Coastal scrub occurs in study area. Species not observed during plant surveys.
Calochortus plummerae	Plummer's mariposa lily	--/-- CRPR 4.2	Perennial bulbiferous herb. Occurs in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and native grassland. Elevation range 325–5,557 ft. Flowering period May–Jul.	**Presumed absent.** Coastal scrub habitat occurs in study area. Species not observed during plant surveys.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Calochortus weedii var. *intermedius*	intermediate mariposa lily	--/-- CRPR 1B.2	Perennial herb. Found on dry, rocky, and open slopes within chaparral, coastal sage scrub, and grasslands. Found within Los Angeles, Orange, Riverside, and San Bernardino Counties. Flowering period: May to July. Elevation: 340 to 2,805 feet (105 and 855 meters).	**Presumed Absent.** Sage scrub habitat present. Species not observed during plant surveys.
Carex buxbaumii	Buxbaum's sedge	--/-- CRPR 4.2	Perennial herb. Occurs in bogs and fens, meadows and seeps (mesic), and marshes and swamps. Elevation range 5–10,825 ft. Flowering period Mar–Aug.	**None.** Bogs, fens, meadows and other mesic habitats are not present in study area.
Caulanthus simulans	Payson's jewelflower	--/-- CRPS 4.2	Perennial herb. Occurs on sandy or granitic soils in chaparral and coastal scrub. Elevation range 400-2,200 meters. Flowering period Feb - May.	**Presumed Absent.** Coastal scrub occurs in study area. Species not observed during plant surveys.
Centromadia pungens ssp. *laevis*	smooth tarplant	--/-- CRPR 1B.1	Annual herb. Occurs on alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodland, and valley and foothill grassland. Found in San Bernardino, Los Angeles, Riverside, and San Diego Counties. Flowering Period: April to September. Elevation: below 2,100 feet (640 meters).	**None.** Chenopod scrub, meadows, playa, riparian and other preferred habitats not present.
Chorizanthe leptotheca	Peninsular spineflower	--/-- CRPR 4.2	Annual herb. Occurs in chaparral, coastal scrub, and lower montane coniferous forest. Elevation range 300–980 ft. Flowering period May–Aug.	**None.** Study area is above the species known elevation range. Species observed during focused surveys.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Chorizanthe parryi var. *parryi*	Parry's spineflower	--/-- CRPR 1B.1	Annual herb. Occurs in sandy soil on flats and foothills in mixed grassland, coastal sage scrub, and chaparral communities. Found in the San Gabriel and San Bernardino Mountains and western Transverse Ranges within Los Angles, San Bernardino, and Riverside County. Flowering Period: April to June. Elevation: 900 to 4,005 feet (275 to 1,220 meters).	**Presumed absent.** Mixed grassland and coastal sage scrub occur in study area. Species observed during focused surveys.
Chorizanthe polygonoides var. *longispina*	long-spined spineflower	--/-- CRPR 1B.2	Annual herb. Occurs in chaparral, coastal scrub, and native grassland, often on clay soils. Found within Orange, Riverside, San Bernardino, and San Diego Counties. Flowering period: April to July. Elevation: 95 to 5,020 feet (30 to 1,530 meters).	**Presumed absent.** Coastal scrub occurs in study area. Species not observed during focused surveys.
Clinopodium chandleri	San Miguel savory	--/-- CRPR 1B.2	Perennial shrub. Occurs within chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland on rocky, gabbroic, or metavolcanic soils. Flowering Period: March to July. Found in Orange, Riverside, and San Diego Counties. Elevation: 390 to 3,525 feet (120 to 1,075 meters.	**Presumed absent.** Coastal scrub and rocky soils present on site. Species not observed during focuses surveys.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Convolvulus simulans	small-flowered morning-glory	--/-- CRPR 4.2	Annual herb. Occurs on clay soils and serpentinite seeps in openings within chaparral, coastal scrub, and native grassland. Found within the San Francisco Bay area, San Joaquin Valley, western Sierra Nevada foothills, along the coast of southern California, the Channel Islands, and the western Transverse and Peninsular Ranges. Flowering period: April to June. Elevation: 95 to 2,430 feet (30 to 740 meters).	**None.** Clay soils and seeps are not present in study area. Species not observed during focuses surveys.
Cryptantha wigginsii	Wiggins' cryptantha	--/-- CRPR 1B.2	Annual herb found in clay soils within coastal scrub habitat. Flowering February – June.	**None.** Clay soils do not occur in study area. Species not observed during focuses surveys.
Deinandra paniculata	paniculate tarplant	--/-- CRPR 4.2	Annual herb. Occurs in vernally mesic areas, sometimes sandy soils, in coastal scrub, valley and foothill grassland, and vernal pools with sandy soil. Found along the coastal regions from San Luis Obispo County south to San Diego County and east to western San Bernardino and Riverside Counties. Flowering Period: March to December. Elevation: 80 to 3,100 feet (25 to 940 meters	**Presumed absent.** Small amount of ephemeral streambed present. Species not observed during focuses surveys.
Dodecahema leptoceras	slender-horned spineflower	FE/SE CRPR 1B.1	Annual herb. Occurs on sandy soils and flood-deposited terraces and washes in chaparral, cismontane woodland, and coastal scrub. Elevation range 655–2,495 ft. Flowering period Apr–Jun.	**Presumed absent.** The drainage and coastal sage scrub in the study area are not the typical habitat for the species. Species not observed during focuses surveys.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Dudleya multicaulis	many-stemmed dudleya	--/-- CRPR 1B.2	Perennial herb. Occurs in dry, stony places associated with coastal sage scrub and valley grasslands. Elevation below 1,968 ft. Flowering period Apr-Jul.	**Presumed Absent.** Coastal sage scrub and rocky soils present. Species not observed during focuses surveys.
Eryngium aristulatum var. *parishii*	San Diego button-celery	FE/-- CRPR 1B.1	Annual or perennial herb. Grows in vernal pools and other mesic areas, such as marshes. Found in Los Angeles, Orange, Riverside, and San Diego Counties. Flowering period: April to June. Elevation: 65 to 2,035 feet (20 to 620 meters).	**None.** Vernal pools, marshes and similar habitats do not occur in study area.
Geothallus tuberosus	Campbell's liverwort	--/-- CRPR 1B.1	Ephemeral liverwort. Occurs on mesic soil, in coastal scrub and vernal pools. Elevation range 30–1,970 ft.	**None.** Mesic soils not present in study area.
Harpagonella palmeri	Palmer's grapplinghook	--/-- CRPR 4.2	Annual herb. Found in clay soils in annual grasslands and coastal sage scrub. Flowering Period: March to May. Elevation: 65 to 3,100 feet (20 to 955 meters).	**None.** Clay soils not present in study area. Species not observed during focuses surveys.
Hesperocyparis forbesii	Tecate cypress	--/-- CRPR 1B.1	Tree. Occurs in closed-cone coniferous forest and southern mixed chaparral on clay, gabbroic or metavolcanic soils. Elevation range 260–4,920 ft.	**None.** Preferred soils, forest and chaparral not present in study area.
Holocarpha virgata ssp. *elongata*	graceful tarplant	--/-- CRPR 4.2	Annual herb. Occurs in grasslands, coastal scrub, chaparral, and cismontane woodland. Found along the southern coast of California and Peninsular Ranges. Flowering period: May to November. Elevation: 195 to 3,600 feet (60 to 1,100 meters).	**Presumed absent.** Grasslands and coastal scrub present in study area. Species not observed during focuses surveys.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Hordeum intercedens	vernal barley	--/-- CRPR 3.2	Annual herb. Occurs in vernal pools, alkaline flats, and dry, saline streambeds. Also found in saline flats and depressions within grasslands. Found in the San Joaquin Valley, South Coast and Peninsular Ranges, San Jacinto Mountains, and southern coast of California. Flowering period: March to June. Elevation: below 3,280 feet (1,000 meters).	**Presumed absent.** Streambed present in study area, but not saline. Species not observed during focuses surveys.
Horkelia cuneata var. *puberula*	mesa horkelia	--/-- CRPR 1B.1	Perennial herb. Occurs in sandy or gravelly soils of maritime chaparral, coastal sage scrub, and woodlands. Found along the southern coast of California, Coast and Peninsular Ranges, and San Jacinto mountains. Flowering Period: February to July. Elevation: 225 to 2,655 feet (70 and 810 meters).	**Presumed absent.** Sandy soils and coastal sage scrub present in study area. Species not observed during focuses surveys.
Juglans californica	Southern California black walnut	--/-- CRPR 4.2	Perennial tree. Occurs in alluvial areas in chaparral, cismontane woodland, coastal scrub, and riparian woodland. Elevation range 160–2,955 ft. Flowering period Mar–May.	**Presumed absent.** Coastal scrub present in study area. Species conspicuous and was not observed during focused surveys.
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	--/-- CRPR 4.2	Perennial herb. Found in moist saline environments such as alkaline seeps and meadows, and coastal salt marshes and swamps. Found along the coastal regions from San Luis Obispo south to San Diego County. Flowering period: May to June. Elevation: below 984 feet (300 meters).	**None.** Moist saline habitats are not present in study area.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Juncus luciensis	Santa Lucia dwarf rush	--/-- CRPR 1B.2	Annual herb. Found on wet, sandy soils of seeps, meadows, streams, and roadsides. Also occurs within vernal pools. Found in northeastern California in the Cascade and northern Sierra Nevada Ranges, Modoc Plateau, and Warner Mountains; and along the Coast, Transverse and Peninsular Ranges of central and southern California. Flowering period: April to July. Elevation: 980 to 6,695 feet (300 to 2,040 meters).	**None.** Wet sandy soils, seeps, meadows and flowing streams are not present in study area.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	--/-- CRPR 1B.1	Annual herb. Grows in vernal pools, playas, and saline habitats within alkali sinks, coastal salt marshes, and wetland communities. Found along the Coast, Sierra Nevada, and Peninsular Ranges; Sacramento and San Joaquin Valleys; central and southern coasts; Mojave Desert, and north Channel Islands. Flowering period: April to May. Elevation: below 4,005 feet (1,220 meters).	**None.** Vernal pools, marshes and other wetland communities are not present in study area.
Lepechinia cardiophylla	Heart-leaved pitcher sage	--/-- CRPR 1B.2	Perennial shrub. Occurs in closed-cone coniferous forest, chaparral, and cismontane woodland. Elevation 600-1,200 meters. Flowering period Apr – Jul.	**None.** Forest, woodland, and chaparral habitats not present in study area.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	--/-- CRPR 4.3	Annual herb. Grows in openings of sage scrub and chaparral at the coastal and foothill elevations throughout California. Typically observed in relatively dry, exposed locales rather than beneath a shrub canopy. Also, found in disturbed areas. Flowering period: March to June. Elevation: below 9,186 feet (2,800 meters).	**Presumed absent.** Sage scrub present in study area. Species not observed during focuses surveys.
Lilium parryi	lemon lily	--/-- CRPR 1B.2	Perennial bulbiferous herb. Occurs in moist montane meadows. Elevation range 4,265-8,530 ft. Flowering period Jul-Aug.	**None.** Moist meadow habitat not present in study area.
Limnanthes alba ssp. *parishii*	Parish's meadowfoam	--/CE CRPR 1B.2	Annual herb. Occurs in montane meadows largely devoid of shrubs and with concentrations of annuals and herbaceous perennials (not grasses). Elevation range 1,969-6,562 ft. Flowering period Apr-May.	**None.** Meadows and areas of herbaceous annual are not present in study area.
Microseris douglasii ssp. *platycarpha*	small-flowered microseris	--/-- CRPR 4.2	Annual herb. Occurs on clay soils in cismontane woodland, coastal scrub, native grassland, and vernal pools. Elevation range below 3,609 feet (1,100 meters). Flowering period Mar–May.	**None.** Clay soils, vernal pools and similar habitat are not present. Species not observed during focuses surveys.
Monardella hypoleuca ssp. *intermedia*	Intermediate monardella	--/-- CRPR 1B.3	Perennial herb. Occurs in chaparral, cismontane woodland, and occasionally lower montane coniferous forest. Usually occurs in understory. Elevation 200-1,250 meters. Flowering period Apr – Sept.	**None.** Chaparral, woodland, and forest habitats are not present in study area.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Myosurus minimus ssp. *apus*	little mousetail	--/-- CRPR 3.1	Annual herb. Occurs in alkaline vernal pools within native grassland. Flowering period: March to June. Found within San Joaquin Valley south to San Diego County and east to western Riverside and San Bernardino Counties. Elevation: 65 to 2,100 feet (20 to 640 meters).	**None.** Vernal pools are not present in study area.
Nama stenocarpa	Mud nama	--/-- CRPR 2B.2	Herb. Occurs in freshwater wetlands and wetland-riparian areas, on muddy lake edges. Elevation below 810 meters. Flowering period January – July.	**None.** Wetland habitats do not occur in the Study area.
Navarretia fossalis	spreading navarretia	FT/-- CRPR 1B.1	Annual herb. Occurs in vernal pools, vernal swales, roadside depressions, playas, marshes and swamps, and chenopod scrub. Population size is strongly correlated with rainfall. Depth of pool appears to be a significant factor as this species is rarely found in shallow pools. Found in the Mojave Desert, desert mountains, Channel Islands, and the Transverse and Peninsular Ranges. Flowering period: April to June. Elevation: 98 to 4,265 feet (30 to 1,300 meters).	**None.** Vernal pools are not present in study area.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Navarretia prostrata	prostrate vernal pool navarretia	--/-- CRPR 1B.1	Annual herb. Occurs in mesic soil within vernal pools in coastal scrub, meadows, seeps, valleys, and foothill grasslands. Grows at mid-levels within the deeper pools to the basin bottoms of the shallower pools. Found in along the central and southern coasts, San Francisco Bay Area, San Joaquin Valley, and the South Coast and Peninsular Ranges. Flowering period: April to July. Elevation: 5 to 3,970 feet (3 to 1,210 meters).	**None.** Vernal pools, seeps and other habitats with mesic soils are not present in study area.
Orcuttia californica	California Orcutt grass	FE/SE CRPR 1B.1	Annual herb. Occurs in vernal pools. Tends to grow in wetter portions of the vernal pool basins but does not show much growth until the basins become somewhat desiccated. Found in the coastal regions of southern California from Ventura County south to San Diego county and in western Riverside County. Flowering period: April to August. Elevation: 45 to 2,165 feet (15 to 660 meters).	**None.** Vernal pools are not present in study area.
Polygala cornuta var. *fishiae*	Fish's milkwort	--/-- CRPR 4.3	Perennial shrub. Occurs within chaparral and oak woodlands. Found along the coastal regions from Santa Barbara County south to San Diego County. Flowering period: May to August. Elevation: 320 to 3,280 feet (100 to 1,000 meters).	**None.** Chaparral and oak woodland habitat do not occur in the study area.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Pseudognaphalium leucocephalum	white rabbit-tobacco	--/-- CRPR 2B.2	Perennial herb. Occurs on sandy or gravelly soils of benches, dry stream bottoms, and canyon bottoms within coastal scrub, chaparral, cismontane woodland, and riparian woodland. Found within southern California from Ventura County south to San Diego County and western Riverside and San Bernardino Counties. Flowering period: July to November. Elevation: below 6,890 feet (2,100 meters).	**Presumed absent.** Dry streams within coastal sage scrub occurs in study area. Species not observed during focuses surveys.
Quercus engelmannii	Engelmann oak	--/-- CRPR 4.2	Perennial tree. Occurs on slopes and foothills within grasslands, chaparral, oak woodland, and riparian woodlands. Found from Los Angeles County south to San Diego County, western Riverside and San Bernardino Counties, and the Channel Islands. Flowering period: March to June. Elevation: 160 to 4,300 feet (50 to 1,300 meters	**Presumed absent.** Species conspicuous, no oak trees observed in study area. Species not observed during focuses surveys.
Romneya coulteri	Coulter's matilija poppy	--/-- CRPR 4.2	Large perennial rhizomatous herb blooming March-July. Occurs in dry washes and canyons in chaparral and coastal sage scrub communities, often in areas that have burned. Elevation: 65–3,346 feet (20–1,020 meters).	**Presumed absent.** Dry wash and coastal sage scrub occur in study area. Species not observed during focuses surveys.
Scutellaria bolanderi ssp. *austromontana*	southern mountains skullcap	--/-- CRPR 1B.2	Perennial herb. Occurs in mesic areas and streambanks in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation range 1,390–6,560 ft. Flowering period Jun–Aug.	**None.** Mesic habitat, chaparral, woodlands, and forest habitats are not present in study area.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Sibaropsis hammittii	Hammitt's clay-cress	--/-- CRPR 1B.2	Annual herb. Occurs in grassland and openings in chaparral on clay soils in Stipa grassland. Elevation range 1,969-4,265 ft. Flowering period Mar-Apr.	**None.** The non-native grassland in the study area is marginal habitat and lacks clay soils. Species not observed during focuses surveys.
Sidalcea neomexicana	Salt spring checkerbloom	--/-- CRPR 2B.2	Perennial herb. Occurs in alkaline springs, marshes, and playas. Elevation below 1,500 meters. Flowering period April – June.	**None.** Alkaline springs, marshes, and playas are not present in study area.
Sphaerocarpos drewei	bottle liverwort	--/-- CRPR 1B.1	Ephemeral liverwort. Occurs on openings in chaparral and coastal scrub. Elevation range 295–1,970 ft.	**Presumed absent.** Coastal sage scrub with openings present. Species not observed during focuses surveys.
Symphyotrichum defoliatum	San Bernardino aster	--/-- CRPR 1B.2	Perennial herb. Occurs near ditches, streams, and springs within grasslands, meadows, coastal scrubs, cismontane woodland, and lower montane coniferous forests. Also grows in disturbed areas. Found in southern California from San Luis Obispo County south to San Diego County and east to Kern and western San Bernardino and Riverside Counties. Flowering period July to November. Elevation: 2 to 6,695 feet (2 to 2,040 meters).	**Presumed absent.** Dry streams, grassland, and coastal scrub present in study area. Species not observed during focuses surveys.
Texosporium sancti-jacobi	woven-spored lichen	--/-- CRPR 3	Lichen. Occurs on soil, small mammal pellets, dead twigs, and on Selaginella spp. in openings in chaparral. Elevation range 195–2,165 ft.	**None.** Chaparral habitat is not present in study area.
Tortula californica	California screw moss	--/-- CRPR 1B.2	Moss. Occurs on sandy soils in chenopod scrub or native grasslands. Elevation range 30–4,790 ft.	**None.** Chenopod scrub and native grasslands do not occur in study area.

Appendix C
Rare Plant Species Potential to Occur[1]

Species Name	Common Name	Status[2]	Habitat, Ecology, and Life History	Potential to Occur[3]
Trichocoronis wrightii var. *wrightii*	Wright's trichocoronis	--/-- CRPR 2B.1	Annual herb. Occurs on alkaline soils in vernal pools, meadows and seeps, marshes and swamps, and riparian forest.	**None.** Vernal pools, meadows, and similar mesic habitats do not occur in the study area.

Source: HELIX (2021)

1 Sensitive species reported on CNDDB and CNPS databases.

2 Listing is as follows: F = Federal; S = State of California; E = Endangered; T = Threatened.
CRPR = California Rare Plant Rank: 1A – presumed extinct; 1B – rare, threatened, or endangered in California and elsewhere; 2A – rare, threatened, or endangered in California and elsewhere; 2B – rare, threatened, or endangered in California but more common elsewhere; 3 – more information on distribution, endangerment, ecology, and/or taxonomic validity is needed. Extension codes: .1 – seriously endangered; .2 – moderately endangered; .
3 – not very endangered.

3 Potential to Occur is assessed as follows: **None**: Habitat suitable for species survival does not occur on the study area, the study area is not within geographic range of the species, and/or the study area is not within the elevation range of the species; **Low**: Suitable habitat is present on the study area but of low quality and/or small extent. The species has not been recorded recently on or near the study area. Although the species was not observed during surveys for the current project, the species cannot be excluded with certainty; **Moderate**: Suitable habitat is present on the study area and the species was recorded recently near the study area; however, the habitat is of moderate quality and/or small extent. Although the species was not observed during surveys for the current project, the species cannot be excluded with certainty; **High**: Suitable habitat of sufficient extent is present on the study area and the species has been recorded recently on or near the study area, but was not observed during surveys for the current project. However, focused/protocol surveys are not required or have not been completed; **Presumed Present**: The species was observed during focused surveys for the current project and is assumed to occupy the study area; **Presumed Absent**: Suitable habitat is present on the study area but focused surveys for the species were negative.

Appendix D

Special-Status Animal Species Potential to Occur

Appendix D
Special Status Animal Species Potential to Occur

Scientific Name	Common Name	Status	Habitat Associations	Potential to Occur
INVERTEBRATES				
Insects				
Bombus crotchii	Crotch bumble bee	--/SCE	Found throughout southwestern California from the Central Valley south to the U.S./Mexico border. Inhabits open grasslands and scrub habitats. Primarily nests underground and forages on a wide variety of flowers, but a short tongue renders it best suited to open flowers with short corollas. Most commonly observed on flowering species in the Fabaceae, Asteraceae, and Lamiaceae families. Occurrence has also been linked to habitats containing *Asclepias, Chaenactis, Lupinus, Medicago, Phacelia,* and *Salvia* genera.	**Low Potential to occur.** Sage scrub and non-native grassland are present in study area, but habitat has been disturbed from previous grading, soils rocky and compact, low friability.
Branchinecta lynchi	Vernal pool fairy shrimp	FT/--	Vernal pool and playa habitat, cool pools, preferable on clay soils.	**Not likely to Occur.** Vernal pool habitat is not present on study area.
Branchinecta sandiegonensis	San Diego fairy shrimp	FE/--	Occurs in seasonally astatic pools which occur in tectonic swales or earth slump basins and other areas of shallow, standing water often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral.	**Not likely to Occur.** Vernal pool habitat is not present on study area.
Cicindela senilis frosti	Senile tiger beetle	--/--	Occurs along marine shoreline, from central California coast south to salt marshes of San Diego, also found at Lake Elsinore.	**Not likely to Occur.** Lake side habitat is not present in study area.
Euphydryas editha quino	Quino checkerspot butterfly	FE/SSC	Open areas, sparse vegetation, flowers. Host plants include *Plantago* spp., *Antirrhinum coulterianum*, *Cordylanthus rigidus.*	**Not likely to Occur.** Host plants not observed.

Appendix D
Special Status Animal Species Potential to Occur

Scientific Name	Common Name	Status	Habitat Associations	Potential to Occur
Linderiella santarosae	Santa Rosa Plateau fairy shrimp	--/--	Occurs in the vernal pools on the Santa Rosa Plateau on southern basalt flow vernal pools.	**Not likely to Occur.** Vernal pool habitat is not present on study area.
Streptocephalus woottoni	Riverside fairy shrimp	FE/--	In California, occurs from Los Angeles County south to coastal San Diego County, and east to western Riverside County. Found in deep seasonal vernal pools, ephemeral ponds, stock ponds, and other human modified depressions at least 30 centimeters deep. Associated with grasslands, which may be interspersed through chaparral or coastal sage scrub vegetation.	**Not likely to Occur.** Vernal pool habitat is not present on study area.
VERTEBRATES				
Amphibians and Reptiles				
Anaxyrus californicus	arroyo toad	FE/SSC	Low flow streams with sparse cover in foothills, valleys and mountains. Requires sandy terraces.	**Not likely to Occur.** Flowing streams absent from study area.
Anniella stebbinsi	Southern California legless lizard	--/SSSC	Coastal dune, sandy washed, alluvial fans, oak woodlands, conifer forest, sandy soils.	**Not likely to Occur.** Dune, sandy wash, alluvial fan and other habitats for species do not occur in the Study area.
Arizona elegans occidentalis	California glossy snake	--/SC	Scrub and grassland habitats, usually with loose or sandy soils. A generalist.	**Not likely to Occur.** Scrub and grassland habitats are present, but soils are compact and rocky.
Cnemidophorus hyperthrus	orange-throated whiptail	--/SSC	Chaparral, sage scrub, grassland, woodland, riparian areas.	**Low Potential to occur.** Sage scrub and grassland habitats occur but are mostly disturbed from prior earthworks.
Aspidoscelis tigris stenjnegeri	coastal western whiptail	--/SSC	Open rocky areas with sparse vegetation usually scrub or grassland.	**Moderate Potential to occur.** Scrub and grassland habitats area present. Species locally common.

Appendix D
Special Status Animal Species Potential to Occur

Scientific Name	Common Name	Status	Habitat Associations	Potential to Occur
Coleonyx variegates abbotti	San Diego banded gecko	--/SSC	Deserts scrub to chaparral with rocky soils; micro-habitat desert species.	**Low Potential to occur.** Scrub habitat and rocky soils present in study area. Property at edge of range for species.
Diadophis punctatus modestus	San Bernardino ringneck snake	--/--	Moist habitats. woodlands, farms, grassland, chaparral.	**Not likely to Occur.** Moist habitats do not occur in study area.
Emys *marmorata pallida*	western pond turtle	--/SSC	Slow-moving streams, ponds, reservoirs, other water bodies deeper than 6 feet with logs or other submerged cover.	**Not likely to Occur.** Flowing streams do not occur in the study area.
Phrynosoma coronatum blainvillei	coast horned lizard	--/SSC	Grassland, scrub, chaparral, woodland with a supply of prey (ants).	**Low Potential to Occur.** Grassland and sage scrub habitats occur in Study area but limited observed of prey (ant).
Rana draytonii	California red-legged frog	FT/SC	Lowland stream, riparian woodland, wetlands.	**Not likely to Occur.** Flowing streams, wetlands and riparian habitats do not occur in study area.
Salvadora hexalepis virgultea	coast patch-nosed snake	--/SSC	Coastal and desert scrub, chaparral, washes. A generalist.	**Low Potential to occur.** Coast scrub occurs in study area but no washes, only dry streams.
Spea hammondii	western spadefoot	--/SSC	Grassland, sage scrub or occasionally chaparral. Standing water, puddles, vernal pools, needed for reproduction.	**Not likely to Occur.** No pool habitat observed in or adjacent to study area.
Taricha torosa	coast range newt	--/SSC	Grassland, woodland associated with ponds, slow-moving streams.	**Not likely to Occur.** Flowing streams are not present in Study area.
Thanmophis hammondii	two-striped garter snake	--/SSC	Stream course with adjacent dense vegetation.	**Not likely to Occur.** Flowing streams are not present in Study area.

Appendix D
Special Status Animal Species Potential to Occur

Scientific Name	Common Name	Status	Habitat Associations	Potential to Occur
Birds				
Accipiter cooperi	Cooper's hawk	--/SSC	This raptor species requires mature forest, open woodlands, and river groves habitat.	**Not Likely to Occur.** The project study area does not contain suitable habitat to support this species. The study area occurs within an upland area lacking any mature trees or woodlands.
Agelaius tricolor	tricolored blackbird	--/SSC	Wetland with dense cattails, tall grasses or thickets of willows.	**Not likely to Occur.** Wetland habitat is not present in study area.
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	--/SSC	Hillsides, with grassland, sage scrub, or chaparral.	**Moderate potential to occur.** Grassland and sage scrub habitat present in study area.
Aquila chrysaetos	golden eagle	--/Fully protected	Open country, prefers mountains or hills.	**Not likely to occur.** Study area is adjacent to development lacking open country.
Artemisiospiza belli belli	Bell's sage sparrow	--/WL	Evenly spaced sage scrub.	**Present.** Species observed foraging in the study area
Asio otus	long-eared owl	--/SSC	Dense vegetation adjacent to open grassland or shrubland, and open forests.	**Not Likely to Occur.** Dense vegetation and open forests habitat does not occur in Study area.
Athene cunicularia	Burrowing owl	-/SSC	Rolling or level terrain with less than 50 percent shrub cover and available burrows, typically abandoned squirrel burrows.	**Not likely to Occur.** Open habitat occurs in study area but lacks potential burrows.
Buteo regalis	ferruginous hawk	--/WL	Large areas of open grassland or shrub with elevated nest sites.	**Low Potential to Occur.** Study area is adjacent to large open shrubland, Unlikely to nest in study area, but may forage.
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	--/SSC	Scrub, desert thickets, and areas with large branching cacti.	**Not likely to Occur.** Study includes a few small cacti, but lacks desert thickets or large branching cacti.

Appendix D
Special Status Animal Species Potential to Occur

Scientific Name	Common Name	Status	Habitat Associations	Potential to Occur
Charadrius alexandrinus nivosus	Western snowy plover	FT/SSC	Coastal beaches, sand dune beaches, river mouths, estuaries.	**Not likely to Occur.** Beaches, sand dunes and rivers do not occur in study area.
Circus cyaneus	northern harrier	--/SSC	Meadows, grassland, scrub, rarely in woodland. Roosts on ground.	**Low Potential to Occur.** Scrub and grassland present in study area. Area disturbed from human activity.
Elanus leucurus	white-tailed kite	--/-- Fully protected	Grassland, agriculture with nearby woodland for nesting.	**Not likely to occur.** Small amount of grassland in study area. High level of human activity.
Eremophila alpestris actia	California horned lark	--/WL	Grassland, agriculture fields, and disturbed fields.	**Low potential to occur.** Disturbed habitat in study area is similar to ruderal grassland and could be utilized by species for foraging.
Haliaeetus leucocephalus	bald Eagle	DL/SE	Large bodies of open water for foraging, Nearby trees for nesting and roosting.	**Not likely to occur.** No body of water in study area. Nearest body of water is 2 miles to west.
Icteria virens	Yellow breasted chat	--/SSC	Wide riparian woodland, dense willow thickets, with well-developed understory.	**Not likely to Occur.** No riparian habitat in the study area.
Lanius ludovicianus	loggerhead shrike	--/SSC	Open grassland or shrubland with trees, utility poles, fence post or other perch sites.	**Low Potential to Occur.** Grassland and shrubland present with a few trees or fence post for perching. Trees are limited.
Plegadis chihi	white-faced ibis	--/SSC	Shallow marshes, spoils banks, meadows, marshes.	**Not likely to Occur.** Marshes, meadows and similar habitat not present in study area.
Polioptila californica californica	coastal California gnatcatcher	FT/SSC	Coastal sage and other low scrub.	**Present.** Two pair were observed in the study area.
Setophaga petechia	Yellow warbler	--/SSC	Riparian woodland and scrub.	**Not likely to Occur.** Riparian habitat does not occur in study area.

Appendix D
Special Status Animal Species Potential to Occur

Scientific Name	Common Name	Status	Habitat Associations	Potential to Occur
Xanthocephalus xanthocephalus	Yellow-headed blackbird	-/SSC	Breeds in wetlands, meadows, marshes and shallow ponds and rivers. Rare in western Riverside County, more common in Central Valley.	**Not likely to Occur.** Wetlands, meadows, marshes and similar habitat does not occur in study area.
Mammals				
Antrozous pallidus	pallid bat	--/--	This bat is usually found in rocky, mountainous areas, and near water. They are also found over open, sparsely vegetated grasslands, and usually roost is cracks of large rocks and caves.	**Not Likely to Occur.** The project study area does not contain suitable habitat to support this species. The study area occurs within an upland area lacking rocky outcrops or caves.
Chaetodipus californicus femoralis	Dulzura pocket mouse	--/SSC	Grassland and chaparral ecotone, sage scrub.	**Not likely to occur.** sage scrub present in study area but soils are rocky and not considered suitable for burrows.
Chaetodipus fallax fallax	Northwestern San Diego pocket mouse	--/SSC	Sage scrub and grassland, sandy soils.	**Not likely to occur. S**age scrub present but soils are rocky and not suitable for burrows.
Dipodomys merriami parvus	San Bernardino kangaroo rat	FE/SSC	Sage scrub, sandy soils, alluvial fans, floodplains.	**Not likely to occur.** Sage scrub present but soils are rocky and not suitable for burrows.
Lasiurus xanthinus	western yellow bat	--/SSC	Desert grassland and scrub with an associated water feature.	**Not likely to occur.** study area lacks an associated water feature.
Lepus californicus bennettii	San Diego black tailed jackrabbit	--/SSC	Primarily open scrub with short grasses.	**Moderate.** Open scrub with short grasses occur in the Study area but are primarily limited to the residential land and small strip of BLM land to the south. Species not observed during the various site visits.
Neotoma lepida	San Diego desert woodrat	--/SSC	Scrub and desert, rock outcrops, or areas of dense cover.	**Not likely to occur.** scrub habitat occur in study area, but Neotoma middens not observed.

Appendix D
Special Status Animal Species Potential to Occur

Scientific Name	Common Name	Status	Habitat Associations	Potential to Occur
Nyctinomops femorosaccus	Pocketed free-tailed bat	--/SSC	Desert scrub, roosts in cliffs, rocky crevices in small colonies.	**Not likely to occur.** sage scrub occurs in study area but not roosting habitat.
Onychomys torridus ramona	southern grasshopper mouse	--/SSC	Grassland and sparse sage scrub.	**Not likely to occur.** grassland and sage scrub present, but rocky soils limit burrow potential.
Perognathus longimembris brevinasus	Los Angeles pocket mouse	--/SSC	Fine sandy soils with sparse vegetation.	**Not likely to occur.** Rocky soils are dominant in study area.
Perognathus longimembris internationalis	Jacumba pocket mouse	--/SSC	Open habitats, grassland, sage scrub with sandy soils.	**Not likely to occur.** Sage scrub present but rocky soils are dominant in study area.
Taxidea taxus	American badger	--/SSC	Upland grasslands, meadows, field. Lives in burrows in ground.	**Not likely to occur.** Meadows and open fields not present, no burrows for species observed.

1 Listing codes are as follows: FE = Federally Endangered; FT = Federally Threatened; FC= Federal Candidate species; BCC = Birds of Conservation Concern; SE = State of California Endangered; FP = State of California Fully Protected; WL = State of California Wait-Listed; SSC = State of California Species of Special Concern.

2 County of San Diego Sensitive Animal List: Group 1 = Animals that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met; Group 2 = Animals that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action; these species tend to be prolific within their suitable habitat types.

Not Likely to Occur - There are no present or historical records of the species occurring on or in the immediate vicinity, (within 3 miles) of the Project Study area and the diagnostic habitats strongly associated with the species do not occur on or in the immediate vicinity of the Study area.

Low Potential to Occur - There is a historical record of the species in the vicinity of the Project Study area and potentially suitable habitat on Site, but existing conditions, such as density of cover, prevalence of non-native species, evidence of disturbance, limited habitat area, isolation, substantially reduce the possibility that the species may occur. The Site is above or below the recognized elevation limits for this species.

Moderate Potential to Occur - The diagnostic habitats associated with the species occur on or in the immediate vicinity of the Project Site, but there is not a recorded occurrence of the species within the immediate vicinity (within 3 miles). Some species that contain extremely limited distributions may be considered moderate, even if there is a recorded occurrence in the immediate vicinity.

High Potential to Occur - There is both suitable habitat associated with the species and a historical record of the species on or in the immediate vicinity of the Project Site (within 3 miles).

Species Present - The species was observed on the Project Site at the time of the survey or during a previous biological survey

This page intentionally left blank

Appendix E

Explanation of Status Codes for Plants and Animals

Appendix E
Explanation of Status Codes for Plant and Animal Species

U.S. FISH AND WILDLIFE SERVICE (USFWS)

BCC Birds of Conservation Concern
FE Federally listed endangered
FT Federally listed threatened

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (CDFW)

SE State listed endangered
ST State listed threatened
SSC State species of special concern
WL Watch List
FP Fully Protected

MULTIPLE SPECIES HABITAT CONSERVATION PLAN (MSHCP) COVERED

MSHCP Covered indicates that the species is part of a proposed list of species (146 total) considered at this time to be adequately conserved by the Western Riverside MSHCP, provided that participants meet all conditions listed in the Final MSHCP.

CALIFORNIA NATIVE PLANT SOCIETY (CNPS) CODES

Lists

1A = Presumed extinct.

1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.

2 = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.

3 = Distribution, endangerment, ecology, and/or taxonomic information needed. Some eligible for state listing.

4 = A watch list for species of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.

List/Threat Code Extensions

.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)

.2 = Fairly endangered in California (20 to 80 percent occurrences threatened)

.3 = Not very endangered in California (less than 20 percent of occurrences threatened, or no current threats known)

A CA Endemic entry corresponds to those taxa that only occur in California.

All List 1A (presumed extinct in California) and some List 3 (need more information; a review list) plants lacking threat information receive no threat code extension. Threat Code guidelines represent only a starting point in threat level assessment. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences are considered in setting the Threat Code.

Appendix F

Coastal California Gnatcatcher Survey Report

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 tel
619.462.0552 fax
www.**helixepi**.com

June 29, 2021 02986.00007.001

Ms. Stacey Love
U.S. Fish and Wildlife Service
2177 Salk Ave., Suite 250
Carlsbad, CA 92008

Subject: 2021 Coastal California Gnatcatcher (*Polioptila californica californica*) Survey Report for the Quail Valley Regional Water Tank III Project.

Dear Ms. Love:

This letter presents the results of a U.S. Fish and Wildlife Service (USFWS) protocol presence/absence survey for the federally listed as threatened coastal California gnatcatcher (*Polioptila californica californica*; CAGN) conducted by HELIX Environmental Planning, Inc. (HELIX) for the Quail Valley Regional Water Tank III Project (project). This report describes the methods used to perform the survey and the results. It is being submitted to the USFWS as a condition of Garrett Huffman's Threatened and Endangered Species Permit 20186A-2.

PROJECT LOCATION

The approximately 5.95-acre Study Area is generally located on Assessor's Parcel Numbers 341-050-006 and 341-050-007, east of the community of Quail Valley, and southeast of South Canyon Drive in the City of Menifee, Riverside County, California (Figure 1, Regional Location). Specifically, the study area is located approximately 2.5 miles west of Interstate 215 in Township 5 South, Range 3 West, Section 30 on the U.S. Geological Survey (USGS) 7.5-minute Romoland quadrangle (Figures 2 and 3, *USGS Topography* and *Aerial Photograph*, respectively). USFWS designated critical habitat for coastal California gnatcatcher occurs immediately adjacent to the south and east of the project study area (Figure 3).

METHODS

The survey consisted of six visits that were performed by HELIX biologist Garrett Huffman (TE 778195-14) between May 6 and June 10, 2021 (Table 1, *Survey Results*), in accordance with the current USFWS protocol[1]. HELIX biologists Rob Hogenauer and Alexander Walsh assisted with the surveys as supervised individuals. The visits were conducted at least seven days apart, between the hours of 6 a.m. and 12 p.m., pursuant to survey protocol. The project proponent, Eastern Municipal Water District, is not a participating entity in the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP), and as such is not subject to the requirements of the MSHCP. For non-participating agencies, the USFWS requires that a minimum of six surveys be conducted, at least one week apart, during the period between March 15 and June 30. The survey area encompassed approximately 2.99 acres of potential CAGN habitat consisting of Riversidean sage scrub (including disturbed and non-native grassland/Riversidean sage scrub mosaic) (Figure 4, 2021 Coastal California Gnatcatcher Survey Results). The remainder of the project study area lacks potential CAGN habitat.

The surveys were conducted by walking within and along the perimeter of suitable CAGN habitat present within the study area. The survey route was arranged to ensure complete survey coverage of habitat with potential for occupancy by CAGN. Surveys were conducted with binoculars to aid in bird detection. Recorded CAGN vocalizations were played sparingly and only if other means of detection had failed. If a CAGN was detected before playing recorded vocalizations, the recordings were not played. Once CAGNs were initially detected in an area, the use of playback was discontinued. The approximate survey route is depicted on Figure 4.

Table 1 details the survey dates, times, and conditions.

Table 1
SURVEY INFORMATION

Site Visit	Survey Date	Biologist(s)	Start/Stop Time	Approx. Acres Surveyed/ Acres per Hour	Start/Stop Weather Conditions
1	05/06/21	Garrett Huffman[1]	10:00 / 11:30	2.99 ac/ 1.9 ac/hr	65°F, wind 0-2 mph, 0% cloud cover 71°F, wind 0-2 mph, 0% cloud cover
2	05/13/21	Garrett Huffman[12]	09:00 / 10:30	2.99 ac/ 1.9 ac/hr	71°F, wind 1-4 mph, 0% cloud cover 75°F, wind 1-4 mph, 0% cloud cover
3	05/20/21	Garrett Huffman[1]	10:00 / 11:00	2.99 ac/ 2.99 ac/hr	65°F, wind 3-6 mph, 60% cloud cover 68°F, wind 2-8 mph, 40% cloud cover
4	05/27/21	Garrett Huffman[1] Rob Hogenaur[2]	10:30 / 12:00	2.99 ac/ 1.9 ac/hr	62°F, wind 0-3 mph, 0% cloud cover 70°F, wind 2-6 mph, 0% cloud cover
5	06/03/21	Garrett Huffman[1] Alexander Walsh[2]	09:30 / 12:00	2.99 ac/ 1.2 ac/hr	75°F, wind 2-5 mph, 0% cloud cover 85°F, wind 2-6 mph, 0% cloud cover
6	06/10/21	Garrett Huffman[1] Alexander Walsh[2]	09:30 / 12:00	2.99 ac/ 1.2 ac/hr	65°F, wind 3-6 mph, 60% cloud cover 68°F, wind 2-8 mph, 40% cloud cover

[1] USFWS Permit 20186A-2
[2] Supervised Individual

---

[1] U.S. Fish and Wildlife Service (USFWS). 1997. Coastal California Gnatcatcher (*Polioptila californica californica*) Presence/Absence Survey Protocol. 5pp.

COASTAL CALIFORNIA GNATCATCHER HABITAT

Riversidean sage scrub (including disturbed) and non-native grassland/Riversidean sage scrub ecotone are the only vegetation communities within the project determined to be suitable for CAGN (Figure 4).

Riversidean Sage Scrub (including disturbed)

Riversidean sage scrub is the most xeric expression of coastal sage scrub, typically found on xeric sites such as steep slopes, severely drained soils, or clays that release stored soil moisture slowly. Typical stands are fairly open and dominated by California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), and foxtail chess (*Bromus madritensis* ssp. *rubens*). Disturbed Riversidean sage scrub contains many of the same shrub species as undisturbed Riversidean sage scrub but is sparser and has a higher proportion of non-native annual species, such as foxtail chess, common ripgut grass (*Bromus diandrus*), short-pod mustard (*Hirschfeldia incana*), and fescue (*Festuca murinum*). Riversidean sage scrub within the project site is dominated by brittlebush (*Encelia farinosa*), white sage (*Salvia apiana*), and California buckwheat.

Non-native Grassland/Riversidean Sage Scrub Mosaic

The study area includes areas that are a mosaic of non-native grassland and Riversidean sage scrub species. This area includes open patches of Riversidean sage scrub, with the open areas vegetated with non-native grasses. Riversidean sage scrub and non-native grassland species occur in roughly equal proportions in this community.

RESULTS

A total of two pairs of CAGN and were detected during the survey effort, although not all individuals were detected during each survey (Figure 4).

One CAGN pair (Pair No. 1) was detected foraging and periodically vocalizing in the northeastern portion of the project site along the slopes of a natural drainage after eliciting a response with audio playback. Pair No.1 was heard vocalizing just outside of the survey area near an existing water tank to the southeast. Individuals from Pair No. 1 were seen in 3 general locations during the surveys (Figure 4). Pair No.1 was observed during surveys 1, 2, 3, and 5.

A second pair (Pair No.2) was detected approximately 150 feet south of where Pair No.1 was detected. Pair No.1 was seen engaging in territorial behavioral display and vocalization with Pair No. 2. During survey 4, an active nest belonging to Pair No.2 was detected in a California buckwheat bush along the western portion of the project site, towards the base of a sloped natural drainage (see Figure 4). The breeding Pair No. 2 was observed taking turns incubating the nest approximately every 20 minutes. The active nest had been incubated for a period of 14 days at the end of survey 6. Pair No. 2 was observed during surveys 2, 4, 5, and 6.

CERTIFICATION

I certify that the information in this survey report and enclosed exhibit fully and accurately represents our work. Please contact Shelby Howard at (619) 669-5417 or Garrett Huffman at (623) 238-1545 if you have any questions.

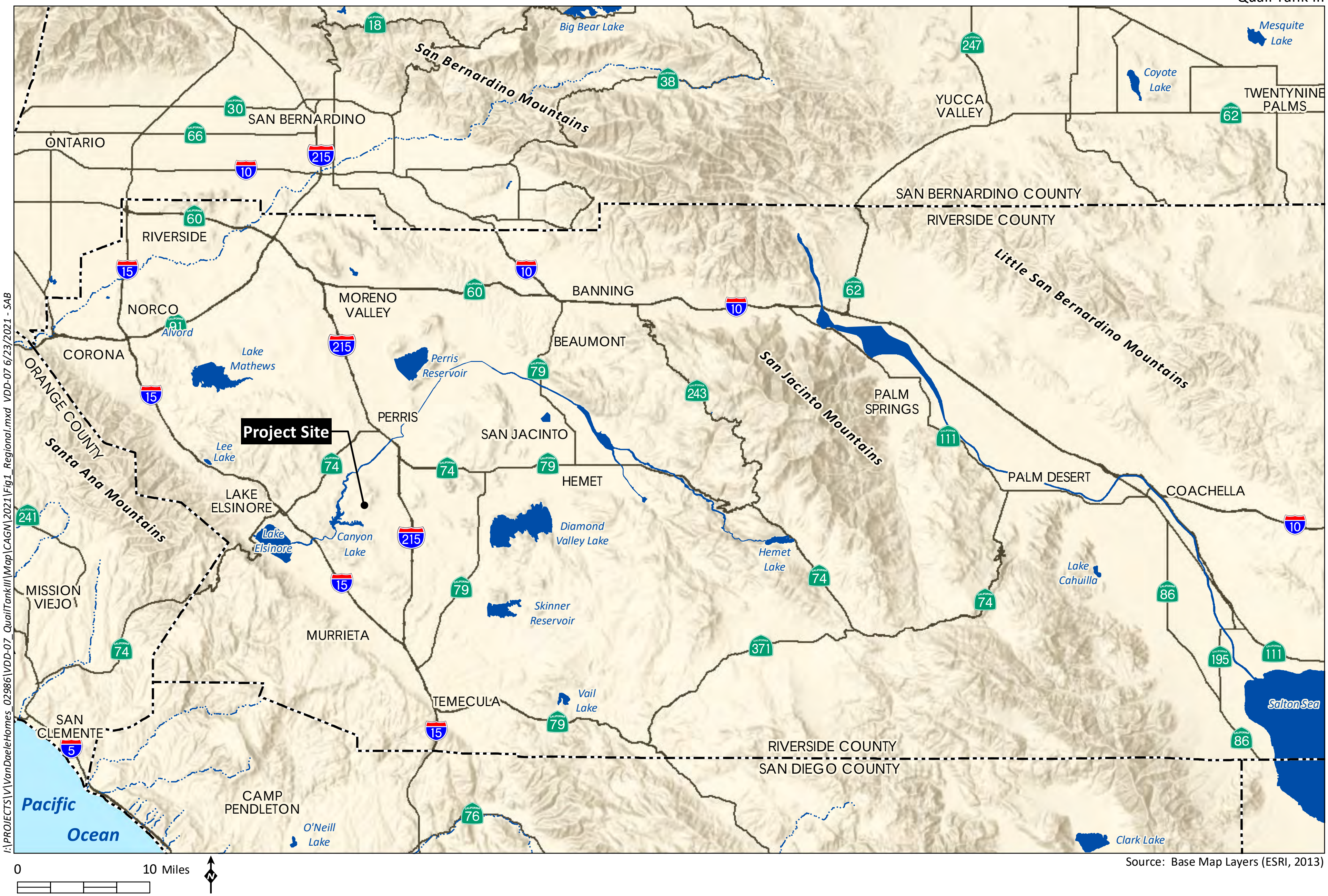
Sincerely,

Garrett Huffman

Garrett Huffman
Biologist

Attachments:

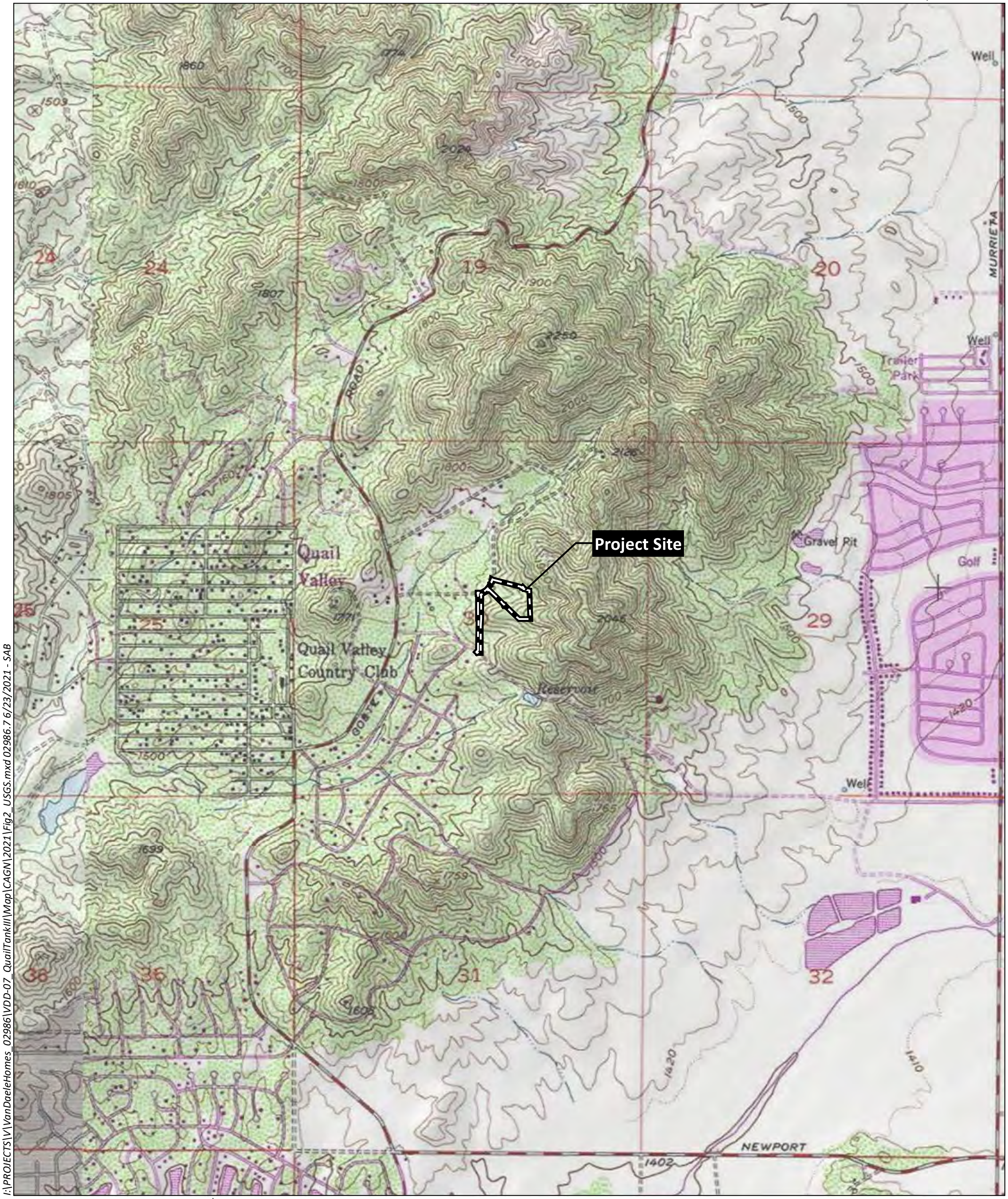
Figure 1: Regional Location
Figure 2: USGS Topography
Figure 3: Aerial Photograph
Figure 4: 2021 Coastal California Gnatcatcher Survey Results



HELIX
Environmental Planning

Regional Location

Figure 1



Source: Romoland 7.5' Quad (USGS)

I:\PROJECTS\V\VanDaeleHomes_02986\VDD-07_QuailTankIII\Map\CAGN\2021\Fig2_USGS.mxd 02986.7 6/23/2021 - SAB

HELIX Environmental Planning

USGS Topography

Figure 2

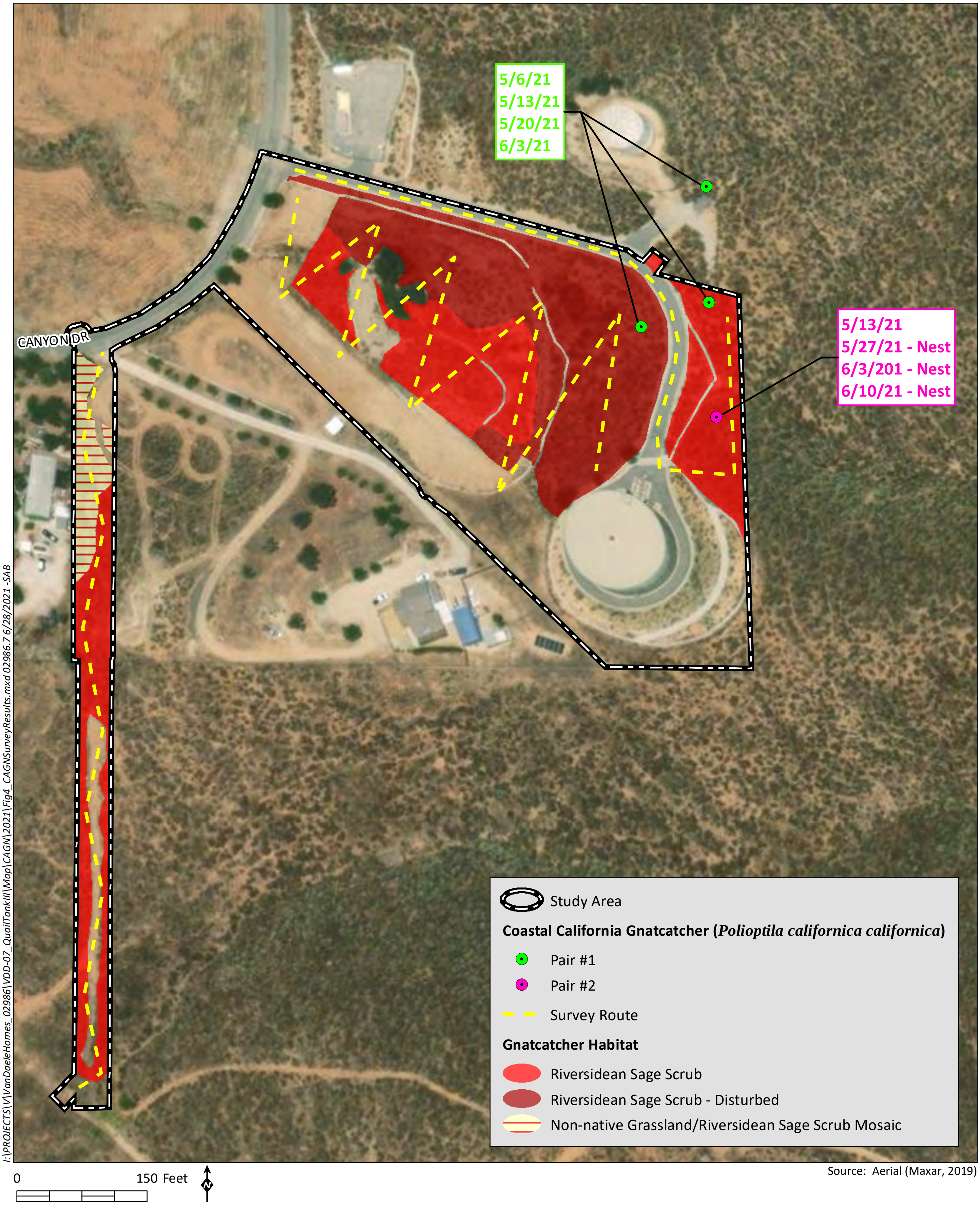
I:\PROJECTS\V\VanDaeleHomes_02986\VDD-07_QuailTankIII\Map\CAGN\2021\Fig3_Aerial.mxd 02986.7 6/28/2021 - SAB

Source: Aerial (Maxar, 2019)

HELIX Environmental Planning

Aerial Photograph

Figure 3



I:\PROJECTS\V\VanDaeleHomes_02986\VDD-07_QuailTankIII\Map\CAGN\2021\Fig4_CAGNSurveyResults.mxd 02986.7 6/28/2021 -SAB

Source: Aerial (Maxar, 2019)

HELIX Environmental Planning

2021 Coastal California Gnatcatcher Survey Results

Figure 4

Appendix G

Representative Site Photos

Overview of site showing the drainage course from east to west. Photo taken January 17, 2022.

View west to east from Canyon Drive showing the culvert and drainage where it exits the site. Photo taken January 17, 2022.

G:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyIIIWaterTankISMND_Photos\011722

View west to east of the drainage where habitats on site change from disturbed to Riversidean sage scrub. Photo taken January 17, 2022.

View of drainage with barely visible bed and bank where the drainage flows between the eucalyptus to the north (photo left) and pepper tree to the south (photo right). Photo taken January 17, 2022.

G:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyIIIWaterTankISMND_Photos\011722

View of west to east of drainage within Riversidean sage scrub located near the center of the project site. Photo taken January 17, 2022.

View of west to east of one of the culvert outfalls located east of the existing tank access road. Photo taken January 17, 2022.

G\PROJECTS\P\PulteGroup_00678\00049_QuailValleyIIIWaterTankISMND_Photos\011722

HELIX
Environmental Planning

Representative Site Photos

IS/MND Appendix C

Cultural Resources Survey

Quail Valley Regional Water Tank III Project

Cultural Resources Survey

February 2022 | 00678.00049.001

Prepared for:

Pulte Group
27401 Los Altos, Suite 400
Mission Viejo, CA 92691

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

Mary Robbins-Wade

Mary Robbins-Wade
Cultural Resources Group Manager

National Archaeological Database Information

Authors:	Trevor Gittelhough, M.A., RPA, Theodore G. Cooley, M.A., RPA, Mary Robbins-Wade, M.A., RPA, and Catherine A. Wright, B.S.
Firm:	HELIX Environmental Planning, Inc.
Client/Project:	Pulte Group/Quail Valley Regional Water Tank III
Report Date:	February 2022
Report Title:	Cultural Resources Survey for the Quail Valley Regional Water Tank III Project, Menifee, Riverside County, California
Submitted to:	Eastern Municipal Water District P.O. Box 8300 Perris, CA 92572-8300
Type of Study:	Cultural resources survey
New Sites:	None
Previously Recorded Sites:	None
USGS Quad:	Romoland 7.5’ USGS quadrangle
Acreage:	5.00 acres
Key Words:	Riverside County; Menifee; Eastern Municipal Water District; Luiseño; negative archaeological survey; cultural resources study; no resources found; Township 5 South, Range 3 West

This page intentionally left blank

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ACBCI	Agua Caliente Band of Cahuilla Indians
AMSL	above mean sea level
APN	Assessor's Parcel Number
BP	before present
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
District	Eastern Municipal Water District
EIC	Eastern Information Center
HELIX	HELIX Environmental Planning, Inc.
NAHC	Native American Heritage Commission
OHP	Office of Historic Preservation
PRC	Public Resources Code
ROW	right-of-way
TCA	Traditionally Culturally Affiliated
TCP	Traditional Cultural Properties
TCR	Tribal Cultural Resources
USGS	U.S. Geological Survey

This page intentionally left blank

EXECUTIVE SUMMARY

HELIX Environmental Planning, Inc. (HELIX) was contracted to provide cultural resources services for the Eastern Municipal Water District (District) Quail Valley Regional Water Tank III Project (project), in the City of Menifee, Riverside County, California.

The project facilities site encompasses 5 acres and is located within Assessor's Parcel Numbers 341-050-006 and 341-050-007 in the community of Quail Valley. The proposed project consists of the construction of a 1.63-million-gallon (mg) potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure.

The tank would have a height of 40 feet and a diameter of 101 feet. The project is anticipated to require 6,105 cubic yards of cut and 28,741 yards of fill, for a total import of 22,636 cubic yards. Surrounding land uses include the Quail Valley Water Tank I approximately 250 feet to the north, the Quail Valley Hydropneumatic Water Pump Station to the northwest, a single-family residence to the south, the Quail Valley Water Tank II approximately 50 feet to the east, and South Canyon Drive and undeveloped land to the west. Access to the project site is via South Canyon Drive and a private access road.

A cultural resources study including a records search, Sacred Lands File search, Native American outreach, a review of historic aerial photographs and maps, and a pedestrian survey, was conducted for the project area. This report details the methods and results of the cultural resources study and has been prepared to comply with the California Environmental Quality Act (CEQA).

A records search conducted at the Eastern Information Center (EIC) on February 3, 2020 indicated that 23 previous cultural resources studies have been conducted within one mile of the project area, none of which overlaps with the project area. The records search results also indicated that a total of five cultural resources have been previously recorded within one mile of the project (one Native American site, one Native American isolate, and three historic buildings); none of these is located in proximity to the project area.

The field investigations included an intensive pedestrian survey of the project area by HELIX and a representative of the Soboba Band of Luiseño Indians on April 19, 2021. The survey did not result in the identification of any cultural material within the project area. As such, no impacts to cultural resources are anticipated. Visibility of the survey area ranged from 25 to 50 percent. While no cultural resources have been identified within the project area, it is possible that soils eroding from the foothills located east of the project may have buried archaeological sites downslope. In addition, the project vicinity has been noted as culturally sensitive to the Luiseño people.

Based on this, it is recommended that an archaeological and Native American monitoring program be implemented for ground-disturbing activities. The monitoring program would include attendance by the archaeologist and Native American monitor(s) at a preconstruction meeting with the grading contractor and the presence of archaeological and Native American monitors during initial ground-disturbing activities within the project area. Both archaeological and Native American monitors would have the authority to temporarily halt or redirect grading and other ground-disturbing activity in the event that cultural resources are encountered. If significant cultural material is encountered, the archaeological Principal Investigator and tribal representatives would coordinate with District staff to develop and implement appropriate avoidance or mitigation measures.

This page intentionally left blank

1.0 INTRODUCTION

1.1 PROJECT LOCATION AND DESCRIPTION

The Eastern Municipal Water District's (District) Quail Valley Regional Water Tank III Project (project) is situated in the City of Menifee in southwestern Riverside County, California (Figure 1, *Regional Location*). The 5-acre facilities site is generally located within the community of Quail Valley, approximately 2.5 miles west of Interstate (I-) 215, northeast of I-15, and east of Goetz Road. The facilities site is on the east side of South Canyon Drive, within Assessor's Parcel Numbers (APNs) 341-050-006 and 341-050-007 (Figures 2 and 3, *USGS Topography* and *Aerial Photograph*, respectively). The study area is located in Township 5 South, Range 3 West, Section 30 on the U.S. Geological Survey (USGS) 7.5-minute Romoland quadrangle (Figure 2).

The project consists of the construction of a 1.63-million-gallon (mg) potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure (Figure 4, *Site Plan*). The tank will have a height of 40 feet and a diameter of 101 feet. The project is anticipated to require 6,105 cubic yards of cut and 28,741 yards of fill, for a total import of 22,636 cubic yards. Surrounding land uses include the Quail Valley Water Tank I approximately 250 feet to the north, the Quail Valley Hydropneumatic Water Pump Station to the northwest, a single-family residence to the south, the Quail Valley Water Tank II approximately 50 feet to the east, and South Canyon Drive and undeveloped land to the west. Access to the project site is via South Canyon Drive and a private access road.

1.2 REGULATORY FRAMEWORK

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Significant resources are those resources that have been found eligible for listing in the California Register of Historical Resources (CRHR).

1.2.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA), Public Resources Code (PRC) 21084.1 and CEQA Guidelines, California Code of Regulations (CCR) Title 14 Section 15064.5 discuss significant cultural resources as "historical resources," and define them as:

- Resource(s) listed in or determined eligible by the State Historical Resources Commission for listing in the CRHR (14 CCR Section 15064.5[a][1]);
- Resource(s) either listed in the National Register of Historic Places (NRHP) or in a "local register of historical resources" or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, unless "the preponderance of evidence demonstrates that it is not historically or culturally significant" (14 CCR Section 15064.5[a][2]);
- Resources determined by the Lead Agency to meet the criteria for listing in the CRHR (14 CCR Section 15064.5[a][3]).

For listing in the CRHR, a historical resource must be significant at the local, state, or national level under one or more of the following four criteria:

A. 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 United States;

B. It is associated with the lives of persons important to local, California, or national history;

C. 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;

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

Under 14 CCR Section 15064.5(a)(4), a resource may also be considered a "historical resource" for the purposes of CEQA at the discretion of the lead agency.

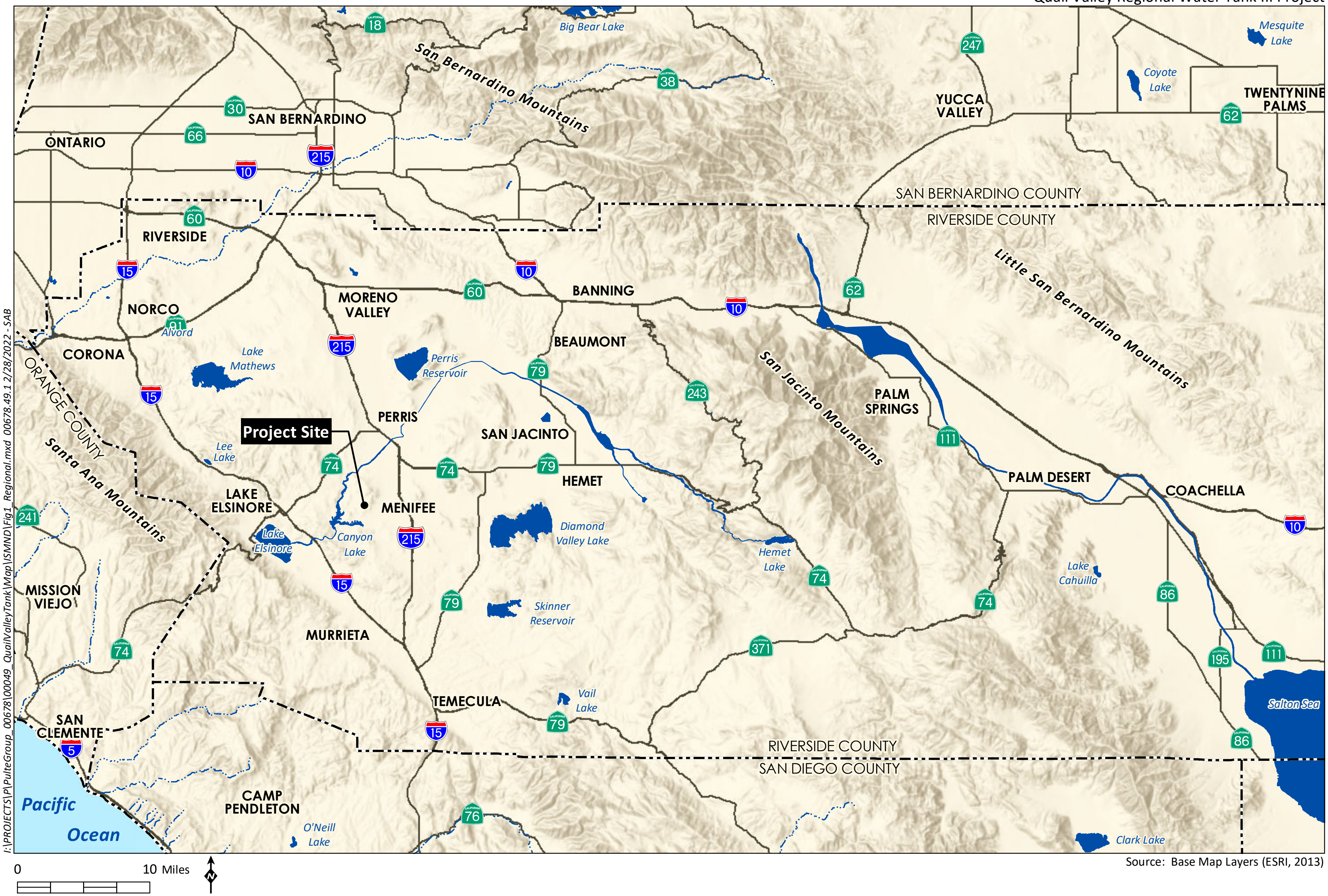
1.2.2 Integrity

All resources that are eligible for listing in CRHR must have integrity, which is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Resources, therefore, must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. In an archaeological deposit, integrity is assessed with reference to the preservation of material constituents and their culturally and historically meaningful spatial relationships. A resource must also be judged with reference to the particular criteria under which it is proposed for nomination.

1.2.3 Native American Heritage Values

State laws mandate that consideration be given to the concerns of contemporary Native Americans with regard to potentially ancestral human remains, associated funerary objects, and items of cultural patrimony. Consequently, an important element in assessing the significance of the study site has been to evaluate the likelihood that these classes of items are present in areas that would be affected by the proposed project.

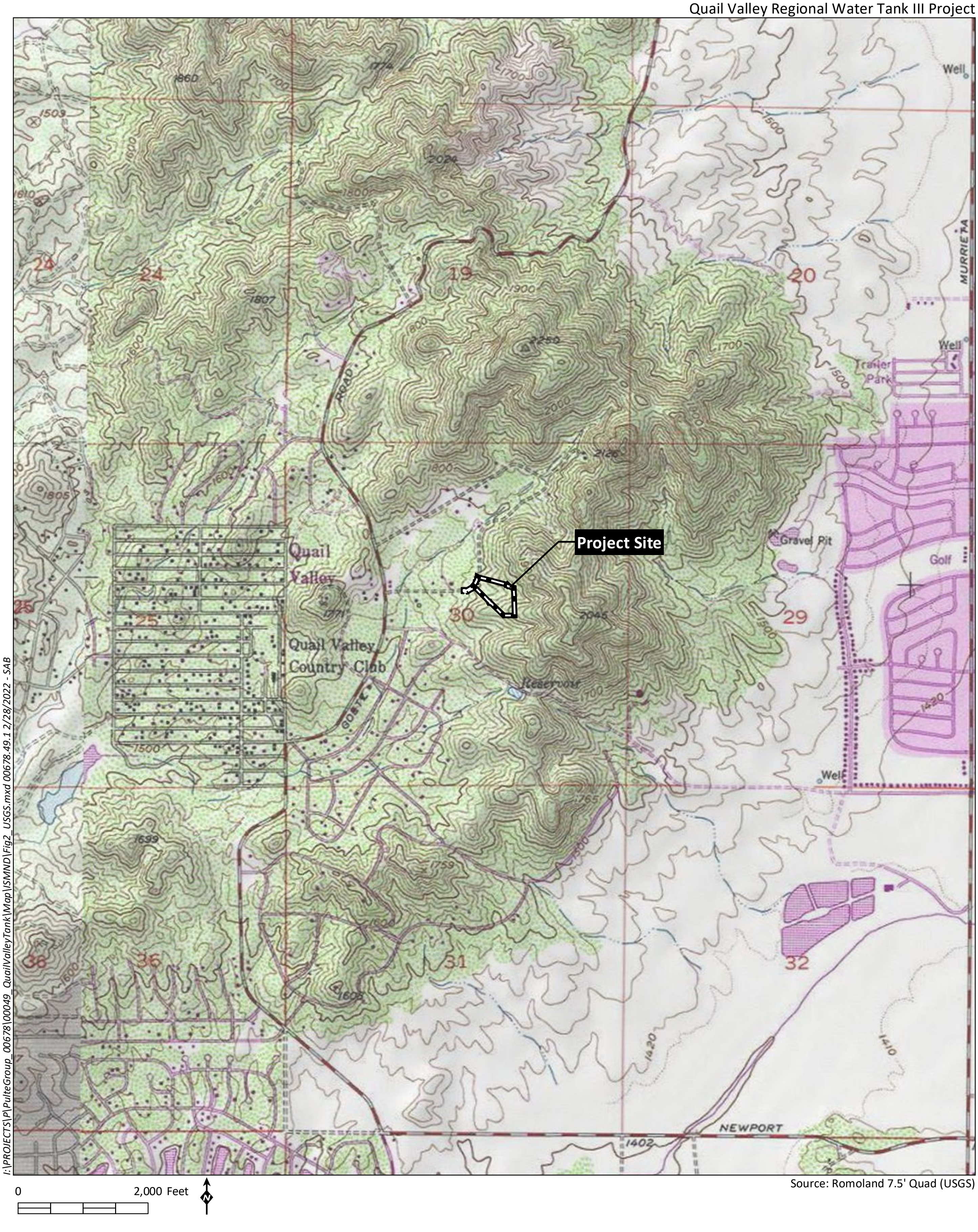
In California, the Traditional Tribal Cultural Places Bill of 2004 requires local governments to consult with Native American Tribes during the project planning process, specifically before adopting or amending a General Plan or a Specific Plan, or when designating land as open space for the purpose of protecting Native American cultural places. The intent of this legislation is to encourage consultation and assist in the preservation of Native American places of prehistoric, archaeological, cultural, spiritual, and ceremonial importance. State Assembly Bill (AB) 52, effective July 1, 2015, introduced the Tribal Cultural Resource (TCR) as a class of cultural resource and additional considerations relating to Native American consultation into CEQA. As a general concept, a TCR is similar to the federally defined TCP; however, it incorporates consideration of local and state significance and required mitigation under CEQA. A TCR may be considered significant if included in a local or state register of historical resources; or determined by the lead agency to be significant pursuant to criteria set forth in PRC §5024.1; or is a geographically defined cultural landscape that meets one or more of these criteria; or is a historical



HELIX Environmental Planning

Regional Location

Figure 1



I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\ISMND\Fig2_USGS.mxd 00678.49.1 2/28/2022 - SAB

Source: Romoland 7.5' Quad (USGS)

HELIX Environmental Planning

USGS Topography

Figure 2

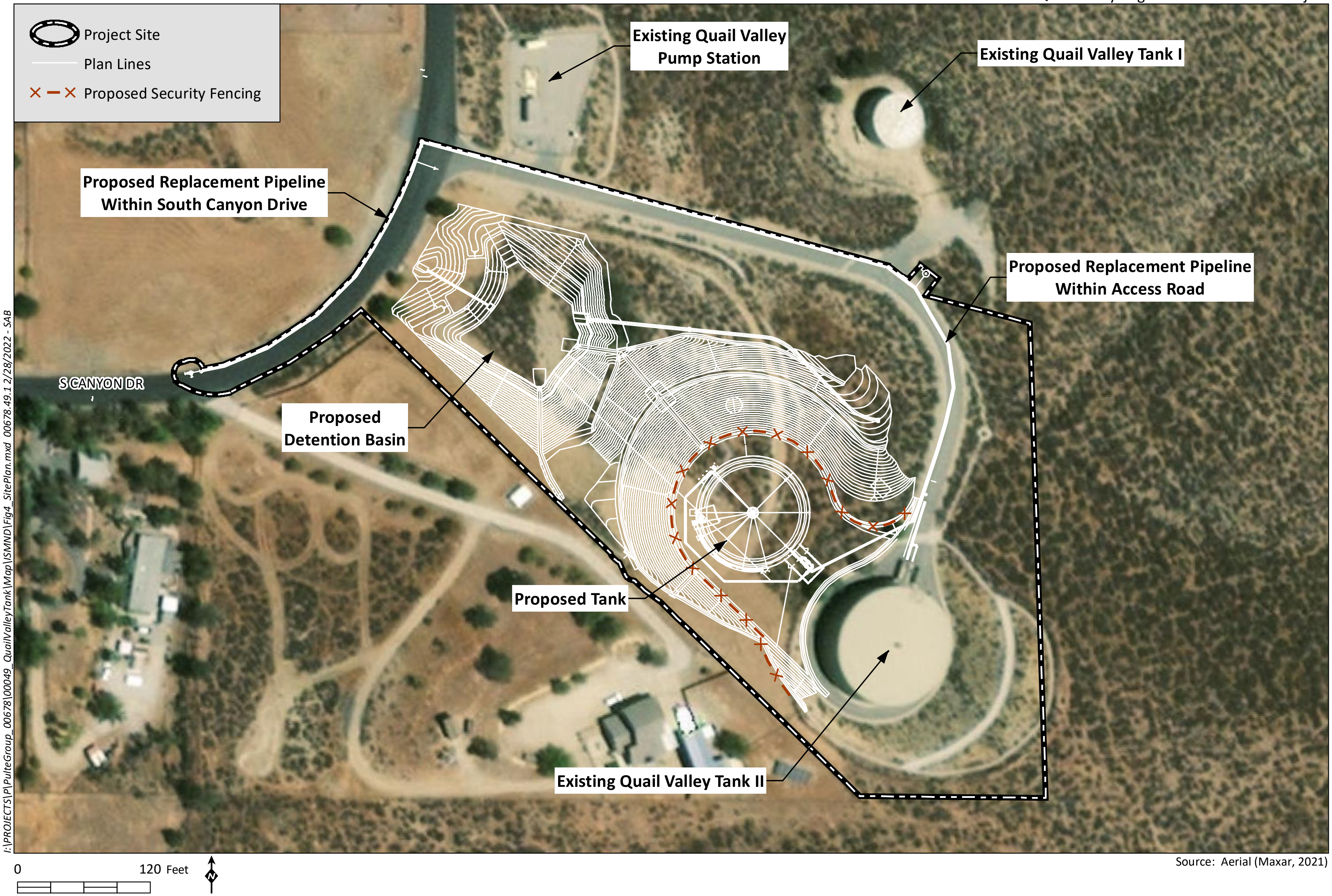
I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\ISMND\Fig3_Aerial.mxd 00678.49.1 2/28/2022 - SAB

Source: Aerial (Maxar, 2021)

HELIX
Environmental Planning

Aerial Photograph

Figure 3



Source: Aerial (Maxar, 2021)

HELIX
Environmental Planning

Site Plan

Figure 4

resource described in PRC §21084.1, a unique archaeological resource described in PRC §21083.2; or is a non-unique archaeological resource if it conforms with the above criteria.

1.3 PROJECT PERSONNEL

A cultural resources survey was conducted by HELIX Environmental Planning, Inc. (HELIX) on April 19, 2021 to assess whether the project would have any effects on cultural resources. Mary Robbins-Wade, M.A., RPA, served as Principal Investigator and report reviewer. Trevor Gittelhough, M.A., RPA, Senior Archaeologist, co-authored this report, with contributions from Theodore G. Cooley, M.A., RPA, and Catherine Wright, B.S. HELIX archaeologist Julie Roy, B.A., conducted the field survey with Victoria Banda (Luiseño Native American monitor) from the Soboba Band of Luiseño Indians (Soboba). Resumes for key project personnel are presented in Appendix A. This report addresses the methods and results of the cultural resources survey, which included a records search, Sacred Lands File search, Native American outreach, review of historic maps and aerial photographs, and an intensive pedestrian field survey.

2.0 PROJECT SETTING

2.1 NATURAL SETTING

The study area is comprised mainly of coastal sage scrub and disturbed habitat. Elevations within the survey area range from approximately 1,794 feet above mean sea level (AMSL) along the edge of the foothills, to approximately 1,712 feet AMSL at the base of the foothills. Surrounding land uses include foothills to the north, east and west and residential development to the west, and beyond the foothills.

Geologically, the surface geology of the project area includes Mesozoic-aged quartz-rich metamorphic rocks including quartzite and quartz-rich metasandstone in the eastern portion of the project area and very old alluvial deposits dating to the early to middle Pleistocene in the westernmost portion of the project area (Morton 2003).

Soils in the study area are primarily Lodo rocky loam (25 to 50 percent slopes, eroded). Additional soils present include Ysidora very fine sandy loam (2 to 15 percent slopes, eroded) and Ysidora gravelly very fine sandy loam, 8 to 25 percent eroded) (Natural Resources Conservation Service 2020). Lodo rocky loam consists of shallow, somewhat excessively drained soils that formed in material weathered from hard shale and fine-grained sandstone. Lodo soils are found in subhumid mountain ranges at lower elevations and foothills throughout California; slopes range from 5 to 75 percent. Lodo soils are excessively drained with medium to rapid runoff and moderate permeability and are underlain by hard metamorphic rock at less than 20 inches below the ground surface. Native vegetation is buckwheat, scattered oak trees, foothill pine, and chaparral. Naturalized vegetation is annual grasses and forbs (Natural Resources Conservation Service 2020). Ysidora very fine sandy loam and gravelly very fine sandy loam soils consist of moderately well-drained alluvium eroded from metasedimentary bedrock. Ysidora soils occur on gently to strongly sloping alluvial fans and terraces at elevations of about 500 to 2,500 feet. The Ysidora soils are moderately well drained and very slowly permeable with medium run-off. The native vegetation associated with Ysidora soils consists of annual grasses and forbs (Natural Resources Conservation Service 2020).

The survey area is mostly vegetated by disturbed coastal sage scrub, which is heavily dominated California buckwheat (*Eriogonum fasciculatum*) and California sagebrush (*Artemisia californica*), with foxtail (*Alopecurus*), blue dick (*Dichelostemma capitatum*), and sumac (*Rhus*), along with imported eucalyptus and pepper trees. The limited ruderal/disturbed annual grassland plant community on site is composed of annual grasses, weeds, and sparse emergent scrub. Plant species within this community include bromes and herbaceous annuals. The native vegetation within the project vicinity would have included a number of plants used by the Luiseño people for food, medicine, shelter, and ritual uses (Hedges and Beresford 1986; Sparkman 1908; White 1963). The native vegetation communities also provide habitats for numerous small mammals, reptiles, birds, and deer, which were exploited by the aboriginal inhabitants of the area for food and other uses. Water would have been available to native populations from a number of nearby unnamed ephemeral drainages from the foothills, along with the nearby San Jacinto River and Salt Creek.

2.2 CULTURAL SETTING

2.2.1 Prehistoric Period

Moratto (1984) has previously defined eight archaeological regions and 16 subregions for California. The location of the project area in the western portion of Riverside County places it within the boundary of the San Diego subregion of the Southern Coast Region (Moratto 1984: 148, Figure 4.13). The following culture history outlines and briefly describes the known prehistoric cultural Traditions and chronology of archaeological sites in the vicinity of the project area. The approximately 10,000 years of documented prehistory of the region has often been divided into three periods: Early Prehistoric Period (San Dieguito Tradition [Warren 1968]), Archaic Period (Milling Stone Horizon [Wallace 1955], Encinitas Tradition [Warren 1968]), and Late Prehistoric Period.

Prior to 1984, when Moratto defined the San Diego subregion, little archaeological investigation had occurred in the westernmost Riverside and San Bernardino counties portion of this subregion. This paucity of archaeological information limited the ability of early researchers to assess the cultural and temporal associations for the archaeological resources in this part of the subregion. One of the few early studies to occur in this area prior to 1984 was conducted near Temecula in the early 1950s at a site identified as the ethnohistoric village of Temeku (McCown 1955). The investigation produced a substantial, primarily Late Prehistoric Period, artifact assemblage, but with some possible late Archaic materials as well. Another early study, conducted in the Cajon Pass area of the San Bernardino Mountains, revealed an apparently late Archaic Period assemblage (Kowta 1969). A study conducted in the 1970s for the construction of the Perris Reservoir (O'Connell et al. 1974, eds.) consisted of investigations at several sites and was, perhaps, the most extensive study conducted in the area prior to 1984. The results, which included several radiocarbon dates, indicated a predominance of occupation at the sites during the Late Prehistoric Period, after AD 1500, but with some limited evidence for occupation as early 380 B.C. (Bettinger 1974:159-162). During the last approximately 35 years since 1984, several archaeological studies have occurred in western Riverside County that have served to substantially augment the archaeological record for the area (e.g., Applied Earth Works, Inc. 2001; Grenda 1997; Horne and McDougal 2008; Keller and McCarthy 1989; McCarthy 1986, 1987). Based on the Information provided by these and other subsequent studies in the area, Sutton and Gardner (2010) and others have recently begun to define the early prehistory of this area of the San Diego subregion and how it fits in with the previously better-known areas of the subregion. The three chronological periods defined for the prehistory of the San Diego subregion are described below.

2.2.1.1 Early Prehistoric Period

The Early Prehistoric Period represents the time of the entrance of the first known human inhabitants into California. In some areas of California, it is referred to as the Paleo-Indian period and is associated with the Big-Game-Hunting activities of the peoples of the last Ice Age occurring during the Terminal Pleistocene (pre-10,000 years ago) and the Early Holocene (beginning circa 10,000 years ago) (Erlandson 1994, 1997; Erlandson et al. 2007). In the western United States, the most substantial evidence for the Paleo-Indian or Big-Game-Hunting peoples derives from finds of large-fluted spear and projectile points (Fluted-Point Tradition) at sites in places such as Clovis and Folsom in the Great Basin and the Desert southwest (Moratto 1984:79–88). In California, most of the evidence for the Fluted-Point Tradition derives principally from areas along the western margins of the Great Basin, including the eastern Sierras and the Mojave Desert, and in the southern Central Valley (Dillon 2002; Rondeau et al. 2007). Elsewhere in California, with the exception of a site in the north coast ranges in northwestern California, CA-LAK-36, only isolated occurrences of fluted spear points have occurred, scattered around the state (Dillon 2002; Rondeau et al. 2007). There have been isolated occurrences, however, including one 37 miles to the southwest of the project area along the coast in southern Orange County (Fitzgerald and Rondeau 2012); three in the San Diego County area including one in the mountainous eastern area of northern San Diego County approximately 46 miles to the southeast of the project area (Kline and Kline 2007); one farther south in Cuyamaca Pass (Dillon 2002; Rondeau et al. 2007), and one to the east near Ocotillo Wells (Rondeau et al. 2007). Two fluted points have also been documented in Baja California (Des Lauriers 2008; Hyland and Gutierrez 1995). Despite these isolated occurrences of fluted points in the San Diego subregion and Baja California, none have been found, to date, in the western Riverside or San Bernardino counties area (Dillon 2002; Rondeau et al. 2007).

The earliest archaeological sites in the San Diego subregion, documented to be over 9,000 years old, belong to the San Dieguito Tradition (Warren et al 1998; Warren and Ore 2011). The San Dieguito Tradition, with an artifact assemblage distinct from that of the Fluted Point Tradition, has been documented mostly in the coastal and near coastal areas in San Diego County (Carrico et al. 1993; Rogers 1966; True and Bouey 1990; Warren 1966; Warren and True 1961) as well as in the southeastern California deserts (Rogers 1939, 1966; Warren 1967). The content of the earliest component of the C.W. Harris Site (CA-SDI-149), located in western San Diego County along the San Dieguito River, approximately 48 miles to the south of the project, formed the basis upon which Warren and others (Rogers 1966; Warren 1966, 1967; Warren and True 1961) identified the "San Dieguito complex," which Warren later reclassified as the San Dieguito Tradition (1968). This Tradition is characterized by an artifact inventory consisting almost entirely of flaked stone biface and scraping tools, but lacking the fluted points associated with the Fluted-Point Tradition. Diagnostic artifact types and categories associated with the San Dieguito Tradition include elongated bifacial knives; leaf-shaped projectile points, scraping tools; crescentics; and in the eastern deserts, Silver Lake and Lake Mojave projectile points (Knell and Becker 2017; Rogers 1939; Vaughan 1982; Warren 1967). Some researchers interpret the San Dieguito Tradition/complex as having a primarily, but not exclusively, hunting subsistence orientation, but sufficiently hunting oriented, as to be distinct from the more gathering-oriented complexes of traits that were to follow in the Archaic Period (Warren 1968; Warren et al. 1998). Other researchers see the San Dieguito subsistence system as less focused on hunting, and more diversified, and, therefore, possibly ancestral to, or a developmental stage for, the subsequent, predominantly gathering oriented, Encinitas Tradition, denoted in the San Diego area as the "La Jolla/Pauma complex" (True 1958, 1980) during the Archaic Period (cf. Bull 1983; Ezell 1987; Gallegos 1985, 1987, 1991; Koerper et al. 1991). While little definite evidence for the San Dieguito Tradition has been discovered in other coastal and near-coastal areas of southern California outside of San Diego County, some evidence has been recently been attributed to it in the eastern Mountains of San Diego County (Pigniolo 2005), and in a coastal area to the north in Los Angeles County (Sutton and Grenda 2012).

2.2.1.2 Archaic Period

During the subsequent Archaic Period, artifact assemblages of the Milling Stone Horizon/Encinitas Tradition occur at a range of coastal and adjacent inland sites, and, in contrast to those of the previous Early Prehistoric Period, are relatively common in the study area region. These assemblages appear to indicate that a relatively stable, sedentary, predominantly gathering complex, possibly associated with one people, was present in the coastal and immediately inland areas of southern California for more than 7,000 years (Warren 1968; Warren et al. 1998; Grenda 1997: Sutton and Gardner 2010).

Warren has proposed that during the Archaic Period in the south coastal region, the Encinitas Tradition began circa 8,500 years ago and extended essentially unchanged until circa 1,500 years ago (Warren 1968:2; Warren et al. 1998). Also during the Archaic Period in the coastal region, beginning somewhere north of San Diego and extending to Santa Barbara, a fourth cultural assemblage, variously described as the Intermediate Horizon (Wallace 1955) or Campbell Tradition (Warren 1968), has been delineated and distinguished, following the Milling Stone Horizon/Encinitas Tradition. This assemblage is distinguished from earlier Archaic assemblages by the presence of large projectile points and milling tools such as the mortar and pestle. The time period of this assemblage is viewed as beginning circa 4,800 years ago and continuing to as late as 1,300 years ago (Warren 1968). While still a matter of some debate, in the southernmost coastal region, Warren and others (1998) have subsequently divided the Archaic Period into a Middle Archaic Period and the time period encompassing the extent of the Intermediate/Campbell cultural assemblage termed as the Final Archaic Period.

A number of sites have been identified in the western Riverside and San Bernardino counties area with early Archaic Period assemblages. Site CA-SBR-5096, located along the Santa Ana River in Prado Basin, approximately 26 miles to the northwest of the project area, has produced “manos and metates, a pinto point and an unknown number of cogged stones and discoidals” (Sutton and Gardner 2010:26). Archaeological investigations conducted at several sites in Perris Valley for the Perris Reservoir project, approximately 10 miles to the north of the project area, produced a single radiocarbon date within the Archaic Period of circa 2200 years before present (BP), as well as a few diagnostic artifacts as the only evidence for a late Archaic Period occupation at the sites (Bettinger 1974:159-162). Investigations at another site, CA-RIV-1806, in the mountains northwest of Temecula, also produced a radiocarbon date for the Late Archaic Period of circa 2775 BP (McCarthy 1986:73). More recently, large-scale archaeological investigations have been conducted for the Eastside Reservoir (since renamed Diamond Valley Lake) Project, located approximately 10 miles east of the project area. This project involved reservoir construction within the adjacent Domenigoni and Diamond valleys (Robinson 2001; Goldberg 2001). Based on the results from this project, the researchers developed a local chronology specific to the Domenigoni and Diamond valleys based on projectile point style changes and associated radiocarbon dates (Robinson 2001). The terminology in this chronology resembles that already presented above with the period from 9,500 to 7,000 years ago designated as the Early Archaic period, the period from 7,000 to 4,000 years ago as the Middle Archaic, and the period from 4,000 to 1,500 years ago as the Late Archaic. Only two components could be firmly dated to the Early Archaic at the reservoir sites, but sparse evidence of Early Archaic activity was noted in six other localities. However, one site did produce two radiocarbon dates of 9190±50 and 9310±60 BP (McDougall 2001). For the Middle Archaic, firm evidence was documented in 14 locations, with other traces at four other sites. During the Late Archaic, a profusion of activity and occupation was evident, with 23 firmly dated site components and sparse evidence at eight other localities (Goldberg 2001:524).

Another archaeological investigation, conducted in proximity to the project area, has also produced evidence for prehistoric occupation in the area during the earliest part of the Archaic Period. This investigation occurred at Lake Elsinore, located approximately 6.5 miles to the southwest of the study area (Grenda 1997). This natural lake is situated in a fault-created basin whose principal source of water in prehistoric times was the San Jacinto River (Grenda 1997:3). Archaeological investigations conducted at a site located along the old lake shoreline indicated occupation as early as 8,500 years ago (Grenda 1997). A recent archaeological investigation conducted in the San Jacinto Valley at site CA-RIV-6069 has produced an early Archaic Period assemblage and occupation as early as 9,400 years ago (Horne and McDougall 2008:91). Thus, prehistoric occupation during the Archaic Period, in areas of western Riverside County and in the study area vicinity, is documented to have occurred, beginning possibly as early as 9,400 years ago and remained present to the end of the period, approximately 1,500 years ago. While this temporal extent correlates with Warren's original proposed extent of the Encinitas Tradition, refinement of his characterization of the Tradition as being a relatively stable, sedentary, predominantly gathering complex, possibly associated with one people, and with an extent mostly restricted to the San Diego County area, may now, based on more recent information available, be subject to some revision (cf. Sutton and Gardener 2010).

2.2.1.3 Late Prehistoric Period

The beginning of the Late Prehistoric Period, circa 1,500 years ago, is seen as a time marked by a number of rather abrupt changes. The magnitude of these changes and the short period of time within which they took place are reflected in significant alteration of previous subsistence practices and the adoption of significant new technologies. As discussed further below, some of this change may have been as a result of significant variations in the climatic conditions. Subsistence and technological changes that occurred include a shift from hunting using atlatl and dart to the bow and arrow; a de-emphasizing of shellfish gathering along some areas of the coast (possibly due to silting-in of the coastal lagoons); and an increase in the storage of crops, such as acorns and pinyon nuts, by both Uto-Aztecan and Yuman peoples. Other new traits introduced during the Late Prehistoric Period include the production of pottery and cremation of the dead, and, locally, in the western Riverside County area, a shift in settlement pattern is apparent (cf. Wilke 1974).

This shift in settlement is first noted during the early part of the period from 1,500 to 750 years ago, and is evidenced, locally, in the results from the Eastside Reservoir (Diamond Lake) Project by a rather sudden decline in occupation in the local area during the initial part of the period. This 750-year period was termed by the Eastside Reservoir researchers as the Saratoga Springs Period, following Warren's (1984) desert terminology. This period can also be seen to partially coincide with a warm and arid period known as the Medieval Warm Period, documented to have occurred between approximately 1,100 and 600 years ago (Jones et al. 1999; Kennett and Kennett 2000; Stine 1994). During this period, at least two episodes of severe drought have also been demonstrated, the first between 1060 and 840 cal BP and the second between 740 and 650 cal BP (Goldberg 2001; Stine 1994). While sites dating to this period are not absent in western Riverside County (e.g., Keller and McCarthy 1989; McCarthy 1987:34), Goldberg (2001) hypothesized that the Medieval Warm Period could account for the decline in sites occurring in the Eastside Reservoir Project area during the Saratoga Springs Period (1500 to 750 BP), claiming that desert and inland areas of western Riverside County, such as where the Eastside Reservoir Project and the current study area are located, would no longer be suitable to support residential bases.

Goldberg (2001) further hypothesized that settlements would possibly be clustered at more suitable water sources during this time, such as at the coast, Lake Cahuilla, or Lake Elsinore (cf. Wilke 1974, 1978). While a decline was noted during the initial part of the Saratoga Springs Period, subsequently, during the latter part of the period, during the time of the Medieval Warm Period, a reoccupation began to occur (Goldberg 2001:578). According to Goldberg, “When components dating to the Medieval Warm segment of the Saratoga Springs Period are segregated and combined with Medieval Warm components from the Late Prehistoric Period, it shows that the frequency of refuse deposits and artifact and toolstone caches during the Medieval Warm is slightly higher than during the Late Archaic and much higher than during the later portion of the Late Prehistoric Period” (2001:578).

In the Eastside Reservoir Project, the Late Prehistoric Period was defined as extending from the end of the Saratoga Springs Period (750 BP to 410 BP). A subsequent Protohistoric Period was also defined as extending from 410 to 150 BP. The Late Prehistoric (750 to 410 BP) was characterized by the presence of Cottonwood points, although research indicated that Cottonwood points had actually begun to appear in the Eastside Reservoir Project study area as early as 950 BP. Ceramics and abundant obsidian began to appear around the time of the Cabrillo exploration in AD 1542; thus, this date (i.e., circa 410 BP) until the establishment of the mission system in the late 1700s was defined as the Protohistoric Period (Robinson 2001). It should also be noted that the end of the Saratoga Springs Period and the beginning of the Late Prehistoric Period (750 BP) also coincides with the onset of the Little Ice Age, generally dated from 750 to 150 BP (Goldberg 2001; Sutton et al. 2007). During this period, the climate was cooler and moister, and the sites identified within the Eastside Reservoir Project study area reflected a substantial increase in number and diversity, longer occupation periods, and more sedentary land use. Similar intensification of land use also occurred during this time in neighboring San Gorgonio Pass (Bean et al. 1991) and Perris Valley (Wilke 1974).

Differing from the terminology used in the Eastside Reservoir study, the Late Prehistoric Period has been more commonly described, archaeologically, in the northern San Diego County and the western portion of Riverside County, as the San Luis Rey (SLR) complex. As originally defined by Meighan (1954), the SLR complex is associated with the ethnohistoric Luiseño who were present in the area at the time of first contact with Europeans. Meighan saw the complex as occurring in two phases: SLR I and SLR II, with the principal archaeological element distinguishing the two phases being the absence of pottery in SLR I sites and its presence in SLR II assemblages. The introduction of pottery was seen as having disseminated to the prehistoric Luiseño from their neighbors, the Kumeyaay, to the south (Meighan 1954:221; Rogers 1936). Elements of the SLR I phase include small, triangular, pressure-flaked projectile points (generally Cottonwood series with Desert Side-notched series points rarely occurring); milling implements, including mortars and pestles, manos and metates, and bedrock milling features; bone awls; Olivella shell beads; other stone and shell ornaments; and cremations (Meighan 1954; Moratto 1984; Pigniolo 2004; True et al. 1974). In addition to pottery, the later SLR II assemblages include several other elements not found in SLR I assemblages: “cremation urns, red and black pictographs, and such nonaboriginal items as metal knives and glass beads” (Meighan 1954:223). SLR I was originally thought by Meighan to date from AD 1400 to AD 1750, with SLR II dating between AD 1750 and AD 1850 (Meighan 1954:223). This chronology was subsequently revised, however, by True and others, who suggested that, while “some pottery probably filtered across from Diegueño [Kumeyaay] territory perhaps as early as AD 1200-1300 under some circumstances, ...the introduction of pottery as a regular and important element in the San Luis Rey lifeway probably did not take place until a century or two before the arrival of the Spanish (perhaps AD 1500-1600)” (True et al. 1974:97).

2.2.2 Ethnohistory

The project area is within the traditional territory of the Luiseño people (Bean and Shipek 1978; Kroeber 1925: Plate 57; Pechanga Tribal Government 2015). The Luiseño, along with the Cahuilla, Gabrieleño (Gabrielino), Juaneño, and Cupeño, comprise the Cupan group of the Takic subfamily of the Uto-Aztecan linguistic stock (Bean and Vane 1979; Miller 1986; Shipley 1978).

The name Luiseño derives from Mission San Luis Rey de Francia and has been used to refer to the Native people associated with the mission. The Luiseño followed a seasonal gathering cycle, with bands occupying a series of campsites within their territory (Bean and Shipek 1978; White 1963). The Luiseño lived in semi-sedentary villages usually located along major drainages, in valley bottoms, and also on the coastal strand, with each family controlling gathering areas (Bean and Shipek 1978; Sparkman 1908; White 1963). True (1990) has indicated that the predominant determining factor for placement of villages and campsites was locations where water was readily available, preferably on a year-round basis. While most of the major Luiseño villages, known ethnographically, were located closer to the coast along the Santa Margarita River Valley and the San Luis Rey River Valley (Bean and Shipek 1978; Kroeber 1925; White 1963), Kroeber (1925) does indicate general locations for three Luiseño villages in more inland areas. He places the village of *Panache* in proximity to Lake Elsinore and the confluence of the San Jacinto River and Temescal Creek, approximately 6.5 miles to the southwest of the project area, and the villages of *Temeku* and *Meha* in the vicinity of the confluence of the upper Santa Margarita River and Temecula Creek, approximately 18 miles to the southeast of the project area (Kroeber 1925: Plate 57; McCown 1955:1).

It must be noted that interpretations by archaeologists and linguistic anthropologists may differ from the traditional knowledge of the Luiseño people. The Luiseño creation story indicates that the Luiseño people have always been here rather than having migrated from elsewhere. The creation story of the Pechanga people tells that the world was created at Temecula. "The Káamalam [first people] moved to a place called Nachíivo Pomíisavo, but it was too small, so they moved to a place called 'exva Teméeku,' this place you now know as Temeku. Here they settled while everything was still in darkness (DuBois 1908)" (Masiel-Zamora 2013:2).

2.2.3 Historical Background

2.2.3.1 Spanish Period

Spanish explorers made their first sailing expeditions along the coast of southern California between the mid-1500s and mid-1700s. In search of the Northwest Passage, Juan Rodríquez Cabríllo stopped in at present-day San Diego Bay in 1542. With his crew, Cabríllo explored the shorelines of present Catalina Island as well as San Pedro and Santa Monica bays. Much of the present California and Oregon coastline was mapped and recorded in the next half-century by Spanish naval officer Sebastián Vizcaíno. Vizcaíno's crew also landed on Santa Catalina Island and at San Pedro and Santa Monica bays, giving each location its longstanding name. The Spanish crown laid claim to California based on the surveys conducted by Cabríllo and Vizcaíno (Bancroft 1886:96–99; Gumprecht 2001:35).

Over 200 years would pass before Spain began the colonization and inland exploration of Alta California. The 1769 overland expedition by Captain Gaspar de Portolá marks the beginning of California's Historic period, occurring just after the King of Spain installed the Franciscan Order to direct religious and colonization matters in assigned territories of the Americas. With a band of 64 soldiers, missionaries, Baja (lower) California Indigenous people, and Mexican civilians, Portolá established the Presidio of San Diego, a fortified military outpost, as the first Spanish settlement in Alta California. In July 1769, while Portolá was exploring Southern California, Franciscan Fr. Junípero Serra founded Mission San Diego de Alcalá at Presidio Hill, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823.

The first documented Spanish contact in what is now Riverside County was by Spanish military captain Juan Bautista de Anza who led expeditions in 1774 and 1775 from Sonora to Monterey (Bolton 1930). Anza embarked on the initial expedition to explore a land route northward through California from Sonora, with the second expedition bringing settlers across the land route to strengthen the colonization of San Francisco (Rolle 1963). Anza's route led from the San Jacinto Mountains northwest through the San Jacinto Valley, which was named “San José” by Anza. Little documentation exists of Anza's route being used after the two expeditions, although it likely saw continued use in bringing Spanish supplies into the newly colonized Alta California (Lech 2004). In 1781, the Spanish government closed the route due to uprisings by the Yuman Indians. However, by that time, the missions were established and self-sufficient; thus, the need for Spanish supplies from Sonora had begun to diminish.

The Mission San Gabriel Arcángel, founded in 1771, was the first Spanish mission established west of th10rojectt area, becoming among the richest in the entire mission system in the 1800s supplying livestock and other supplies to settlers and settlements throughout Alta California (Macias 2004). However, the construction and founding of the Mission also caused the population of the local Gabrieleño to plummet due to poor living conditions and disease (Hackel 2003). This led the local indigenous peoples to revolt against the Mission several times after its establishment.

Although Riverside County proved to be too far inland to include any missions within its limits, Missions San Juan Capistrano and San Luis Rey de Francia, established in 1776 and 1798 respectively, claimed a large part of southwestern Riverside County. Due to the inland geographical location of the Cahuilla territory, the Spanish missions did not have as direct an effect on them as they did on the Luiseño who lived along the coast (Bean 1978). On the coast, the Luiseño were moved into the Mission environment, where living conditions and diseases promoted the decline of the Luiseño population (Bean and Shipek 1978). However, throughout the Spanish Period, the influence of the Spanish progressively spread further from the coast and into the inland areas of southern California, as Missions San Luis Rey and San Gabriel extended their influence into the surrounding regions and used the lands for grazing cattle and other animals.

In the 1810s, ranchos and mission outposts called *asistencias* were established, increasing the amount of Spanish contact in the region. Asistencias were established in Pala in 1818 and in San Bernardino in 1819. Additionally, Rancho San Jacinto was established for cattle grazing in the San Jacinto Valley (Bean and Vane 1980; Brigandi 1999). In 1820, Father Payeras, a senior mission official, promoted the idea that the San Bernardino and Pala *asistencias* be developed into full missions in order to establish an inland mission system (Lech 2004). However, Mexico won its independence from Spain in 1821, bringing an end to the Spanish Period in California.

2.2.3.2 Mexican Period

After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. Despite this, Spanish patterns of culture and influence remained for a time. The missions continued to operate as they had in the past, and laws governing the distribution of land were also retained in the 1820s. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants.

Following the secularization of the missions in 1834, extensive land grants were established in the interior during the Mexican period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated their colonization efforts. The secularization of the missions following Mexico's independence from Spain resulted in the subdivision of former mission lands and establishment of many additional ranchos that were granted to prominent and well-connected individuals, ushering in the Rancho Era, with the society making a transition from one dominated by the church and the military to a more civilian population, with people living on ranchos or in pueblos. During the supremacy of the ranchos (1834–1848), landowners largely focused on the cattle industry and devoted large tracts to grazing. Cattle hides became a primary southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of nonnative inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants.

2.2.3.3 American Period

War in 1846 between Mexico and the United States began at the Battle of Chino, a clash between resident Californios and Americans in the San Bernardino area. This battle was a defeat for the Americans and bolstered the Californios' resolve against American rule, emboldening them to continue the offensive in later battles at Dominguez Field and in San Gabriel (Beattie 1942). However, this early skirmish was not a sign of things to come, and the Americans were ultimately the victors of this two-year war. The Mexican-American War officially ended with the Treaty of Guadalupe Hidalgo in 1848, which resulted in the annexation of California and much of the present-day southwest, ushering California into its American period.

California's acquisition by the United States substantially increased the growth of the non-native population in California, which officially became a state with the Compromise of 1850, that also designated Utah and New Mexico (with present-day Arizona) as U.S. territories. Horticulture and livestock, based primarily on cattle as the currency and staple of the rancho system, continued to dominate the southern California economy through the 1850s. The Gold Rush began in 1848; with the influx of people seeking gold, cattle were no longer desired mainly for their hides, but also as a source of meat and other goods. During the 1850s cattle boom, rancho vaqueros drove large herds from southern to northern California to feed that region's burgeoning mining and commercial boom. Cattle were at first driven along major trails or roads such as the Gila Trail or Southern Overland Trail, then were transported by trains when available. The cattle boom ended for southern California as neighboring states and territories drove herds to northern California at reduced prices. Operation of the huge ranchos became increasingly difficult, and droughts severely reduced their productivity (Cleland 1941).

While the American system required that the newly acquired land be surveyed prior to settlement, the Treaty of Guadalupe Hidalgo bound the United States to honor the land claims of Mexican citizens who were granted ownership of ranchos by the Mexican government (Lech 2004). The Land Act of 1851 established a board of commissioners to review land grant claims, and land patents for the land grants were issued from 1876 to 1893.

3.0 ARCHIVAL RESEARCH AND CONTACT PROGRAM

3.1 RECORDS SEARCH

HELIX staff obtained a records search of the California Historical Resources Information System (CHRIS) at the Eastern Information Center (EIC) on February 03, 2020. The records search covered the project site and a one-mile radius around it and included a review of archaeological and historical resource data, locations and citations for previous cultural resources studies, and a review of the State Office of Historic Preservation's (OHP's) historic properties directory. A records search summary and map are included as Appendix C (Confidential Appendices, bound separately).

3.1.1 Previous Studies

The records search identified 23 previous cultural resource studies within the records search limits, none of which is adjacent to or includes portions of the project area (Table 1, *Previous Studies within One Mile of the Project Area*). Eleven studies were noted as cultural resources assessments, four were surveys, one an inventory, one an investigation, two were "studies", two were site visits, one noted "cell site", and one was a monitoring project. Presumably, all of these included some form of fieldwork.

Table 1
PREVIOUS STUDIES WITHIN ONE MILE OF THE PROJECT AREA

Report No.	Report Title	Author, Date
RI-00391	An Archaeological Survey of the Proposed Subdivision – Tentative Parcel Map 13384, Goetz Road North of Quail Valley, Riverside County, California	Dover [Drover], 1978
RI-01971	Cultural Resources Investigation - Audie Murphy Ranch, Riverside County, California	Peter, 1985
RI-02184	An Archaeological Assessment of Tentative Parcel 22745 Located South of Sun City in Western Riverside County, California	McCarthy, 1987
RI-02670	An Archaeological Assessment of a 1.16 Acre Tract of Land Designated Lot 1, Tract 5410, 8706, Located in Quail Valley, Riverside County.	De Munck, 1988
RI-02745	Archaeological Survey of the Canyon Heights Project: a 275 Acre Property in the Quail Valley Area of Riverside County, California	Brown, 1990
RI-04375	An Archaeological Assessment of the Eastern Municipal Water District Menifee Desalter Project, Sun City and Menifee, Riverside County.	White and White, 1999
RI-04516	A Phase I Cultural Resources Assessment of a Portion of Tentative Tract Map 28920, +60.0 Acres of Land Located Near Sun City, Riverside County, California	Keller, 2000
RI-04878	A Phase I Archaeological Resources Survey of Specific Plan 272, the Canyon Heights Project, a 272.71-Acre Residential Project Located in the Quail Valley, County of Riverside, California	Dice and Nay Irish, 2001
RI-05404	Historical/Archaeological Resources Survey Report, Sun City Assisted Living Community, Valley Boulevard, Sun City, Riverside County, CA	Love, Tang, Ballester, and Hernandez, 2001

Report No.	Report Title	Author, Date
RI-05625	A Cultural Resources Assessment of a 64.2 Acre Parcel Located Adjacent to Goetz Road in the Community of Quail Valley, Unincorporated, Riverside County	White and White, 2005
RI-06793	Letter Report: Goetz Cell Site (CA-7296B)	McKenna, 2005
RI-06988	Cultural Resources Assessment: 12.54-Acre Jacaranda Park Project Area, Community of Sun City, Riverside County, California	Glenn, 2006
RI-08569	Cultural Resources Inventory of Selected Routes Within the South Coast Management Planning Area	Bholat, Chandler, and Mason, 2008
RI-09093	Addendum to Phase I Cultural Resources Assessment: Tentative Tract Map No. 36658 (Off-site Improvements) City of Menifee, Riverside County, California CRM TECH Contract No. 2802	Hotgan [Hogan], 2014
RI-09260	Cultural Resource Assessment Class III Inventory, Verizon Wireless Services Texas Facility City of Menifee, County of Riverside, California	Fulton, 2014
RI-09725	Cultural Resource Assessment Class III Inventory, Verizon Wireless Services Texas Facility, City of Menifee, County of Riverside, California	Fulton, 2015
RI-10161	Phase 1 Cultural Resources Assessment: Tadis Homes 21 Lot Residential Development Project City of Menifee, Riverside County, California	Belcourt, 2016
RI-10288	A Class III Archaeological Study for the Tract 28859 Project for Section 106 Compliance, Riverside County, California	Stropes and Smith, 2017
RI-10308	A Class III Archaeological Study for the Tract 28859 Project for Section 106 Compliance	Stropes and Smith, 2017
RI-10537	Results of Archaeological Monitoring at Audie Murphy Ranch, TR 31822-1, -2, and -F; TR 36484; and TR 36485-2 through -11 and -F (GP 14-070; PM32269), City of Menifee, California	Smith, 2018
RI-10538	Archaeological Assessment of the PA-7 School Site at Audie Murphy Ranch	Smith, 2018
RI-10608	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate RS-0085-01 (Anaya), 27772 Goetz Road, Canyon Lake, Riverside County, California	Bonner and Aislin-Kay, 2005
RI-10648	Cultural Resource Records Search and Site Visit Results for Cellco Partnership and their Controlled Affiliates doing business as Verizon Wireless Candidate 'Texas', South Canyon Drive, Unaddressed Parcel, Menifee, Riverside County, California	Wills, 2016
RI-10538	An Archaeological Survey of the Proposed Subdivision--Tentative Parcel Map 13384, Goetz Road North of Quail Valley, Riverside County, California	Dover, 1978
RI-10608	Cultural Resources Investigation - Audie Murphy Ranch, Riverside County, California	Peter, 1985
RI-10648	An Archaeological Assessment of Tentative Parcel 22745 Located South of Sun City in Western Riverside County, California	McCarthy, 1987

3.1.2 Previously Recorded Resources

The EIC has a record of five previously recorded cultural resources within a one-mile radius of the project, none of which is documented within the project site (Table 2, *Previously Recorded Resources within One Mile of the Project Area*). P-33-007652 is the clubhouse for the circa (ca.) 1956 Quail Valley Country Club, which is situated west of the project at 28702 Anita Drive. P-33-007653 is a ca. 1931 wood-frame house located at 23790 Clara Place. P-33-007679 is a ca. 1942 adobe-built residence located at 23866 Elsinore Lane. P-33-010949 (CA-RIV-6619) is a prehistoric lithic scatter situated southeast of the project. Finally, P-33-028062 is an isolated chert biface situated almost one mile south of the project. None of the resources is within a half mile of the project area.

Table 2
PREVIOUSLY RECORDED RESOURCES WITHIN ONE MILE OF THE PROJECT AREA

Resource Number (P-33-)	Resource Number (CA-RIV-)	Age and Resources Present	Description	Recorder, Date
P-33-007652	NA	Historic	Vernacular brick building (Quail Valley Country Club clubhouse), ca. 1956	Lege, 1982
P-33-007653	NA	Historic	Wood frame residence, ca. 1931	Lege, 1982
P-33-007679	NA	Historic	Vernacular adobe residence, ca. 1942	Lege, 1982
P-33-010949	CA-RIV-6619	Prehistoric	Lithic scatter	Keller, 2000
P-33-028062	CA-RIV-28062	Prehistoric	Isolate (chert biface)	Goralogia, 2018

3.2 OTHER ARCHIVAL RESEARCH

Various additional archival sources were consulted, including historic topographic maps and aerial imagery. These include aerials from 1967, 1979, 1997, 2002, 2005, 2009, 2010, 2012, 2014, and 2016 (NETR Online 2021) and several historic USGS topographic maps, including the 1901 Elsinore (1:125,000), the 1942 and 1943 Murrieta (1:62,500), and the 1953, 1973, and 1979 Romoland (1:24,000) topographic maps. The purpose of this research was to identify historic structures and land use in the area. No structures appear within the project on the historic topographic maps; however, the alignment for South Canyon Drive first appears on the 1953 Romoland topographic map. The region remains largely undeveloped with the majority of development occurring in the 1950s to the north and west of the project. The project site and lands immediately surrounding it remain vacant until the late 1970s, when sparse residential development appears to the north and west of the project. By the 1979 aerial photo, Quail Valley Tank I is shown just north of the project site, and the existing tank within the project site appears on the aerial taken in 2005 (NETR Online 2021).

3.3 NATIVE AMERICAN CONTACT PROGRAM

HELIX contacted the Native American Heritage Commission (NAHC) on January 31, 2020 for a Sacred Land File search and list of Native American contacts for the project area. The NAHC indicated in a response dated February 12, 2020 that no known sacred lands or Native American cultural resources are documented within the project area. Letters were sent on February 19, 2020 to Native American representatives and interested parties identified by the NAHC. Five responses have been received to date, as summarized in Table 3, *Native American Contact Program Responses*. The response from the Pechanga Band of Luiseño Indians (Pechanga) indicated that the project is in proximity to a known

Traditional Cultural Property. The response from Soboba noted that areas of potential impact were identified during an in-house database search. If additional responses are received, they will be forwarded to Eastern staff. Native American correspondence is included as Appendix D (Confidential Appendices, bound separately). District staff will initiate consultation with interested tribes under AB 52.

Table 3
NATIVE AMERICAN CONTACT PROGRAM RESPONSES

Contact/Tribe	Response
Morongo Band of Mission Indians	Responded in an email dated February 26, 2020. Regarding the above referenced project, we have no additional comments to provide at this time.
Rincon Band of Luiseño Indians	Responded in a letter dated March 10, 2020. The identified location is within the Territory of the Luiseño people, and is also within Rincon's specific area of Historic interest. Embedded in the Luiseño territory are Rincon's history, culture and identity. We do not have knowledge of cultural resources within or near the proposed project area. However, this does not mean that none exist. We recommend that an archaeological record search be conducted and ask that a copy of the results be provided to the Rincon Band.
Agua Caliente Band of Cahuilla Indians (ACBCI)	Responded in a letter dated March 16, 2020. The project area is not located within the boundaries of the ACBCI Reservation. However, it is within the Tribe's Traditional Use Area. For this reason, the ACBCI THPO requests the following: • A copy of the records search with associated survey reports and site records from the information center. • Copies of any cultural resource documentation (report and site records) generated in connection with this project.
Pechanga Band of Luiseño Indians	Responded in a letter dated March 17, 2020. After reviewing the provided maps and our internal documents, we have determined that the Project area is not within reservation lands although it is within our ancestral territory. Based on our cultural knowledge of the Project area, the Tribe requests to be involved in the Quail Valley Potable Water Tank Ill Project. The Project is less than 3 miles from the Tribe's reservation and less than a mile and a half from a registered Tribal Cultural Property. While the Tribe understands that portions of the property are disturbed there is still a potential for portions of the Project to reach native soils and impact subsurface cultural resources; therefore, the Tribe requests to be involved in this project. At this time, the Tribe requests the following so we may continue the consultation process and to provide adequate and appropriate recommendations for the Project: 1. Notification once the Project begins the entitlement process, if it has not already; 2. Copies of all applicable archaeological reports, site records, proposed grading plans and environmental documents (EA/IS/MND/EIR, etc.);

Contact/Tribe	Response
	3. Government-to-government consultation with the Lead Agency; and 4. The Tribe believes that monitoring by a Riverside County qualified archaeologist and a professional Pechanga Tribe monitor may be required during earthmoving activities. Therefore, the Tribe reserves its right to make additional comments and recommendations once the environmental documents have been received and fully reviewed. Further, in the event that subsurface cultural resources are identified, the Tribe requests consultation with the Project proponent and Lead Agency regarding the treatment and disposition of all artifacts.
Soboba Band of Luiseño Indians	Responded in a letter dated March 18, 2020. The information provided to us on said project has been assessed through our Cultural Resource Department, where it was concluded that although it is outside the existing reservation, the project area does fall within the bounds of our Tribal Traditional Use Areas. This project location is in proximity to known sites, is a shared use area that was used in ongoing trade between the tribes and is considered to be culturally sensitive by the people of Soboba. Soboba Band of Luiseño Indians is requesting the following: 1. To initiate a consultation with the project proponents and lead agency. 2. The transfer of information to the Soboba Band of Luiseno Indians regarding the progress of this project should be done as soon as new developments occur. 3. Soboba Band of Luiseño Indians continues to act as a consulting tribal entity for this project. 4. Working in and around traditional use areas intensifies the possibility of encountering cultural resources during the construction/excavation phase. For this reason, the Soboba Band of Luiseño Indians requests that Native American Monitor(s) from the Soboba Band of Luiseño Indians Cultural Resource Department to be present during any ground disturbing proceedings. Including surveys and archaeological testing. 5. Request that proper procedures be taken, and requests of the tribe be honored Multiple areas of potential impact were identified during an in-house database search. Specifics to be discussed in consultation with the lead agency.

4.0 SURVEY

4.1 SURVEY METHODS

An intensive pedestrian survey was undertaken by HELIX archaeologist Julie Roy and Soboba tribal cultural monitor Victoria Banda on April 19, 2021. The survey consisted of walking the project area in transects spaced approximately 5 meters apart, where possible. The ground surface was examined for the presence of prehistoric artifacts (such as flaked stone tools, debitage, and ground stone tools), ecofacts (including shell and bone), historic-era artifacts, sediment discoloration that might indicate the presence of a cultural midden, depressions, and other features that might indicate the presence of occupation or ruined structures or buildings.

4.2 SURVEY RESULTS

Surface visibility in the project area varied from poor (0-25 percent) to good (26-50 percent), with a large amount of vegetation comprised of seasonal grasses and forbs from the coastal sage shrub vegetation group. Sediment consisted of a light brown sandy loam with a concentration of gravels and decomposing sedimentary terrace rock. The project includes a steep west facing slope of a foothill and a natural drainage that has been modified. Modern development of the project area includes a large water tank, built paved roads, culverts, cement v-ditches, earthen berms, and fencing. The ground has been highly disturbed in all areas of the project. Terrace rock and gravel makes up large portions of this disturbed area, along with non-native and native plant regrowth. No cultural resources were identified during this survey.

5.0 SUMMARY AND MANAGEMENT RECOMMENDATIONS

A study was undertaken to identify whether cultural resources are present in the Quail Regional Water Tank III project area and to determine the potential effects of the project on cultural resources. A records search did not identify any cultural resources within the project area, however, two prehistoric resources and three historic resources, are located within a one-mile radius of the project area: a lithic scatter with ground stone fragments (P-33-10944/CA-RIV-6619), an isolated chert biface (P-33-28062/CA-RIV-2806), and three historic structures (P-33-007652, P-33-007653, and P-33-007679). The survey did not identify any additional cultural resources within the project area; therefore, no impacts to cultural resources are anticipated.

5.1 MANAGEMENT RECOMMENDATIONS

Based on the results of the current study, no historical resources, as defined by CEQA, will be affected by the project. While no cultural resources have been identified within the project area, one prehistoric site and one prehistoric isolate have been recorded within a mile of the project are. In addition, the area is sensitive for cultural resources, as noted by Soboba and Pechanga.

A response received from the ACBCI indicated that the project area is situated within the Tribe's Traditional Use Area and requested copies of cultural resource documentation (report and site records) associated with the project. The Rincon Band of Luiseño Indians indicated the project is located within the Traditional Use Area of the Luiseño people and is also within Rincon's specific area of Historic interest. Rincon requested a copy of the records search results be provided to them. The Morongo Band of Mission Indians had no comment on the project.

Pechanga determined that while the project area is not within reservation lands, it is within their ancestral territory and less than a mile and a half from a registered Tribal Cultural Property. Pechanga requested notification once the project begins the entitlement process; copies of all applicable archaeological reports, site records, proposed grading plans and environmental documents (EA/IS/MND/EIR, etc.); government-to-government consultation with the Lead Agency; and, potentially, monitoring by a Riverside County qualified archaeologist and a professional Pechanga Tribal monitor during earthmoving activities. Soboba indicated that multiple areas of potential impact were identified during an in-house database search and that specifics will be discussed in consultation with the lead agency.

Based on this cultural sensitivity and the fact that soils eroding downslope from the nearby foothills may have obscured sites within the project area, it is recommended that an archaeological and Native American monitoring program be implemented. The monitoring program would include attendance by the archaeologist and Native American monitor(s) at a preconstruction meeting with the grading contractor and the presence of archaeological and Native American monitors during initial ground-disturbing activities on site. Both archaeological and Native American monitors would have the authority to temporarily halt or redirect grading and other ground-disturbing activity in the event that cultural resources are encountered. If significant cultural material is encountered, the archaeological Principal Investigator and tribal representatives will coordinate with District staff to develop and implement appropriate avoidance or mitigation measures. The proposed monitoring program is detailed below.

In the unlikely event that human remains are discovered, the County Coroner shall be contacted. If the remains are determined to be of Native American origin, the Most Likely Descendant, as identified by the NAHC, shall be contacted in order to determine proper treatment and disposition of the remains. All requirements of Health & Safety Code §7050.5 and PRC §5097.98 shall be followed.

Should the project limits change to incorporate new areas of proposed disturbance, archaeological survey of these areas will be required.

MM CULT-1 Cultural Resources Treatment and Monitoring Agreement. At least 30 days prior to the start of any ground-disturbing activities, Eastern Municipal Water District shall contact the Consulting Tribe(s) to develop Cultural Resource Treatment Monitoring Agreement(s) ("Agreement"). The Agreement(s) shall address the treatment of archaeological resources inadvertently discovered on the project site; project grading; ground disturbance and development scheduling; the designation, responsibilities, and participation of tribal monitor(s) during grading, excavation, and ground disturbing activities; and compensation for the tribal monitors, including overtime, weekend rates, and mileage reimbursements.

MM CULT-2 Develop a Cultural Resources Monitoring Plan. Prior to any grading activities, a Cultural Resources Monitoring Plan shall be prepared by a qualified archaeologist in consultation with the Consulting Tribe(s). The plan shall also identify the location and timing of cultural resources monitoring. The plan shall contain an allowance that the qualified archaeologist, based on observations of subsurface soil stratigraphy or other factors during initial grading, and in consultation with the Native American monitor and the lead agency, may reduce or discontinue monitoring as warranted if the archaeologist determines that the possibility of encountering archaeological deposits is low. The plan shall outline the appropriate measures to be followed in the event of unanticipated discovery of cultural resources during project implementation (including during the survey to occur following vegetation removal and monitoring during ground-disturbing activities). The plan shall identify avoidance as the preferred manner of mitigating impacts to cultural resources. The plan shall establish the criteria utilized to evaluate the historic significance (per CEQA) of the discoveries, methods of avoidance consistent with CEQA Guidelines Section 15126.4(b)(3), as well as identify the appropriate data recovery methods and procedures to mitigate the effect of the project if avoidance of significant historical or unique archaeological resources is determined to be infeasible. The plan shall also include reporting of monitoring results within a timely manner, disposition of artifacts, curation of data, and dissemination of reports to local and state repositories, libraries, and interested professionals. A qualified archaeologist and Consulting Tribe(s) tribal monitor shall attend a pre-grade meeting with Eastern Municipal Water District staff, the contractor, and appropriate subcontractors to discuss the monitoring program, including protocols to be followed in the event that cultural material is encountered.

MM CULT-3 Tribal Monitoring Agreements. A qualified archaeological monitor and a Consulting Tribe(s) monitor shall be present for ground-disturbing activities associated with the project, and both the project archaeologist and Tribal Monitor(s) will make a determination as to the areas with a potential for encountering cultural material. At least seven business days prior to project grading, Eastern Municipal Water District shall contact the tribal monitors to notify the Tribe of grading/excavation and the monitoring program/schedule, and to coordinate with the Tribe on the monitoring work schedule. Both the archaeologist and the tribal monitor shall have the authority to stop and redirect grading activities in order to evaluate the nature and significance of any archaeological resources discovered within the project limits. Such evaluation shall include culturally appropriate temporary and permanent treatment pursuant to the Cultural Resources Treatment and Monitoring Agreement, which may include avoidance of cultural resources, in-place preservation, data recovery, and/or reburial so the resources are not subject to further disturbance in perpetuity. Any reburial shall occur at a location predetermined between Eastern Municipal Water District and the Consulting Tribe(s), details of which shall be addressed in the Cultural Resources Treatment and Monitoring Agreement in MM CR-1. Treatment may also include curation of the cultural resources at a tribal curation facility, as determined in discussion among Eastern Municipal Water District, the project archaeologist, and the tribal representatives and addressed in the Cultural Resources Treatment and Monitoring Agreement referenced in MM CR-1.

MM CULT-4 Evaluation of Discovered Artifacts. All artifacts discovered at the development site shall be inventoried and analyzed by the project archaeologist and tribal monitor(s). A monitoring report will be prepared, detailing the methods and results of the monitoring program, as well as the disposition of any cultural material encountered. If no cultural material is encountered, a brief letter report will be sufficient to document monitoring activities.

MM CULT-5 Disposition of Inadvertent Discoveries. In the event that Native American cultural resources are recovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries with the tribe. Eastern Municipal Water District shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts and non-human remains as part of the required mitigation for impacts to cultural resources, and adhere to the following:

1) Preservation-in-place is the preferred option; preservation-in-place means avoiding the resources and leaving them in the place where they were found with no development affecting the integrity of the resource.

2) If preservation-in-place is not feasible, on-site reburial of the discovered items as detailed in the Monitoring Plan required pursuant to MM CR-2 is the next preferable treatment measure. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments.

3) In the event that on-site reburial is not feasible, Eastern Municipal Water District will enter into a curation agreement with an appropriate qualified repository within Riverside County that meets federal standards per 36 Code of Federal Regulations 800 Part 79 and therefore would be curated and made available to other archaeologists/researchers for further study. The collections and associated records shall be transferred, including title, to an appropriate curation facility within Riverside County, to be accompanied by payment of the fees necessary for permanent curation.

MM CULT-6 Non-Disclosure of Reburial Locations. It is understood by all parties that unless otherwise required by law, the site of any reburial of culturally sensitive resources shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The Coroner, pursuant to the specific exemption set forth in California Government Code 6254(r), parties, and Lead Agencies will be asked to withhold public disclosure information related to such reburial.

MM CULT-7 Human Remains. If Native American human remains are encountered, Public Resources Code Section 5097.98 and California Health and Safety Code Section 7050.5 will be followed. If human remains are encountered no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the coroner shall contact the NAHC within 24 hours. Subsequently, the NAHC shall identify the person or persons it believes to be the "most likely descendant." The most likely descendant shall then make recommendations and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.

6.0 REFERENCES

Applied EarthWorks, Inc.

2001 *Metropolitan Water District of Southern California, Eastside Reservoir Project, Final Report of Archaeological Investigations*. Volumes I to V. General editor, Susan K. Goldberg. Report prepared for the Metropolitan Water District of Southern California, Los Angeles.

Bean, Lowell John

1978 Cahuilla. In *California*, edited by Robert F. Heizer, pp. 575-587. Handbook of North American Indians, vol. 8. William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Bean, Lowell John, and Florence C. Shipek

1978 Luiseño. In *California*, edited by Robert F. Heizer, pp. 550-563. *The Handbook of North American Indians*, vol. 8. William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Bean, Lowell J., and Sylvia B. Vane (editors)

1979 *Native Americans of Western Riverside County California and the Devers-Mira Loma 500kV Transmission Line Route (Lamb-Canyon-Mira Loma Section)*. Prepared by Cultural Systems Research, Inc., Menlo Park, California, for Southern California Edison Company, Rosemead, California.

1980 *The Ethnography and History of the Devers to Lamb Canyon Transmission Corridor Area, Riverside County, California*. Prepared by Cultural Systems Research, Inc., Menlo Park, California, for Southern California Edison Company, Rosemead California.

Bean, Lowell J., Sylvia B. Vane, and Jackson Young

1991 *The Cahuilla Landscape: The Santa Rosa and San Jacinto Mountains.* Ballena Press, Menlo Park, CA.

Bettinger, Robert L.

1974 Dating the Perris Reservoir Assemblages. In *Perris Reservoir Archaeology,* edited by James F. O'Connell, Philip J. Wilke, Thomas F. King, Carol L. Mix, pp. 159–162. California Department of Parks and Recreation Reports No. 14. Sacramento.

Bolton, Herbert E.

1930 *Anza's California Expeditions, Vols. I–IV*. University of California Press, Berkeley.

Brigandi, Phil

1999 The Outposts of Mission San Luis Rey. *Journal of San Diego History* 45(2):106–112.

Bull, Charles S.

1983 Shaking the Foundations: The Evidence for San Diego Prehistory. *Casual Papers: Cultural Resource Management* 1(3):15-64. Cultural Resource Management Center, San Diego State University.

Carrico, Richard L., Theodore G. Cooley, and Joyce M. Clevenger

1993 *Archaeological Excavations at the Harris Site Complex, San Diego County, California.* Report prepared by Ogden Environmental and Energy Services, and on file at the South Coastal Information Center (SCIC), San Diego State University, San Diego.

Des Lauriers, Matthew R.

2008 A Paleoindian Fluted Point from Isla Cedros, Baja, California. *Journal of Island & Coastal Archaeology* 3:271–276.

Dillon, Brian D.

2002 California Paleo-Indians: Lack of Evidence, or Evidence of a Lack? In *Essays in California Archaeology: A Memorial to Franklin Fenenga*. Edited by William J. Wallace and Francis A. Riddell. Contributions of the University of California Archaeological Research Facility, No. 60. Berkeley, California.

DuBois, Constance

1908 The Religion of the Luiseño Indians of Southern California. *University of California Publications in American Archaeology and Ethnology* 8(3):69-186.

Erlandson, Jon M.

1994 *Early Hunter-Gatherers of the California Coast*. New York, Plenum Press.

1997 The Middle Holocene along the California Coast. In *Archaeology of the California Coast during the Middle Holocene*, edited by Jon M. Erlandson and Michael A. Glassow. pp. 61–72. *Perspectives in California Archaeology*, Vol. 4, Jeanne E. Arnold, series editor. Institute of Archaeology, University of California, Los Angeles.

Erlandson, Jon M., Torben C. Rick, Terry L. Jones, and Judith F. Porcasi

2007 One If by Land, Two If by Sea: Who Were the First Californians? In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 53–62. Altamira Press, Lanham, Maryland.

Ezell, Paul H.

1987 The Harris Site – An Atypical San Dieguito Site, or Am I Beating a Dead Horse? In *San Dieguito–La Jolla: Chronology and Controversy*, edited by Dennis Gallegos, pp. 15-22. San Diego County Archaeological Society Research Paper Number 1. San Diego.

Fitzgerald, Richard T., and Michael F. Rondeau

2012 A Fluted Projectile Point from Crystal Cove State Park, Orange County, Alta California. *California Archaeology* 4(2):247-256.

Gallegos, Dennis R.

1985 Batiquitos Lagoon Revisited*.* *Casual Papers Cultural Resource Management* 2(1). Department of Anthropology, San Diego State University, California.

1987 A Review and Synthesis of Environmental and Cultural Material for the Batiquitos Lagoon Region. In *San Dieguito-La Jolla: Chronology and Controversy*, edited by Dennis Gallegos, pp. 23-34. San Diego County Archaeological Society, Research Paper 1.

Gallegos, Dennis R. (cont.)

1991 Antiquity and Adaptation at Agua Hedionda, Carlsbad, California. In *Hunter-Gatherers of Early Holocene Coastal California*, edited by Jon M. Erlandson and Roger H. Colten., pp. 19–42. Perspectives in California Archaeology, Vol. 1, Jeanne E. Arnold, series editor. Institute of Archaeology, University of California, Los Angeles.

Goldberg, Susan

2001 Land Use, Mobility, and Intensification Evaluation and Refinement of the Model. In *Metropolitan Water District of Southern California, Eastside Reservoir Project, Final Report of Archaeological Investigations, Volume IV: Prehistoric Archaeology Synthesis of Findings*, edited by Susan K. Goldberg, Chapter 14. Report prepared by Applied Earthworks, Hemet, California for Metropolitan Water District of Southern California, Los Angeles.

Grenda, Donn R.

1997 *Continuity & Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore*. Statistical Research Technical Series 59, Tucson.

Hedges, Ken, and Christina Beresford

1986 *Santa Ysabel Ethnobotany*. San Diego Museum of Man Ethnic Technology Notes No. 20.

Horne, Melinda C, and Dennis P. McDougall

2008 *CA-RIV-6069: Early Archaic Settlement and Subsistence in the San Jacinto Valley. Western Riverside County, California*. Report prepared for and submitted to the Metropolitan Water District of Southern California. On file at the EIC.

Hyland, Justin R., and Maria De La Luz Gutierrez

1995 An Obsidian Fluted Point from Central Baja California. *The Journal of California and Great Basin Anthropology* 17(1): 126–128.

Jones, Terry L., Gary M. Brown, L. Mark Raab, Janet L. McVicker, W. Geoffrey Spaulding, Douglas J. Kennett, Andrew York, and Phillip L. Walker

1999 Environmental Imperatives Reconsidered. Demographic Crisis in Western North America during the Medieval Climatic Anomaly. *Current Anthropology* 40:137–170.

Keller, Jean Salpas, and Daniel F. McCarthy

1989 Data Recovery at the Cole Canyon Site (CA-RIV-1139), Riverside County, California. *Pacific Coast Archaeological Society Quarterly* 25(1):1-89.

Kennett, Douglas J., and James P. Kennett

2000 Competitive and Cooperative Responses to Climatic Instability in Coastal Southern California. *American Antiquity* 65:379–395.

Kline, George E., and Victoria L. Kline

2007 Fluted Point Recovered from San Diego County Excavation. *Proceedings of the Society for California Archaeology* 20:55–59.

Knell, Edward, Phillips, and Mark S. Becker

1990 DPR site form for CA-RIV-3994. Form on file at the Eastern Information Center, University of California, Riverside.

Koerper, Henry C., Paul E. Langenwalter II, and Adella Schroth

1991 Early Holocene Adaptations and the Transition Phase Problem: Evidence from the Allan O. Kelly Site, Agua Hedionda Lagoon. In *Hunter-Gatherers of Early Holocene Coastal California*, edited by Jon M. Erlandson and Roger H. Colton, 43–62. Perspectives in California Archaeology, Vol. 1, Jeanne E. Arnold, series editor. Institute of Archaeology, University of California, Los Angeles.

Kroeber, A.L.

1925 *Handbook of California Indians*. American Bureau of Ethnology Bulletin 78. Washington, D.C. Lithographed edition 1953, Third Printing 1970, California Book Company, LTD, Berkeley.

Lech, Steve

2004 *Along the Old Roads: A History of the Portion of Southern California That Became Riverside County, 1772–1893*. Steve Lech, Riverside, California

Masiel-Zamora, Myra Ruth

2013 *Analysis of 'Éxva Teméeku, a Luiseño Indian Village Site Named Temeku, Located in Temecula, California*. Unpublished Master's thesis, Department of Anthropology, San Diego State University.

McCarthy, Daniel F.

1986 Archaeological Studies at Hi Card Ranch (CA-RIV-1806), Santa Rosa Plateau, Riverside, County, California. *Pacific Coast Archaeological Society Quarterly* 22(2):45-79.

1987 Archaeological Studies at Wildomar, CA-RIV-2769, Riverside, County, California. *Pacific Coast Archaeological Society Quarterly* 23(1):1-46.

McCown, B.E.

1955 *Temeku. A Page from the History of the Luiseño Indians*. Archaeological Survey Association of Southern California Paper No. 3.

Meighan, Clement W.

1954 A Late Complex in Southern California Prehistory. *Southwestern Journal of Anthropology* 10(2):215-227.

Miller, Wick R.

1986 Numic Languages. In *Great Basin*, edited by W. L. D'Azevedo, pp. 98–112. Handbook of North American Indians, Vol. 11. William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Moratto, Michael J.

1984 *California Archaeology*. Academic Press, Orlando

Morton, D.M.

2003 *Geologic Map of the Romoland 7.5' Quadrangle, Riverside County, California*. Version 1.0. Digital preparation by Kelly R. Bovard and Greg Morton. U.S. Geological Survey, Department of Earth Sciences, University of California, Riverside.

2020 Natural Resources Conservation Service. *Web Soil Survey*. U.S. Department of Agriculture. Electronic document, available at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

NETR Online

2021 *Historic Aerials*. Nationwide Environmental Title Research, LLC. Electronic document available at: http://www.historicaerials.com.

O'Connell, James F., Philip J. Wilke, Thomas F. King and Carol L. Mix, editors

1974 *Perris Reservoir Archaeology: Late Prehistoric Demographic Change in Southeastern California*. Report prepared by the Archaeological Research Unit, Department of Anthropology, University of California, Riverside, California, for the State of California Department of Parks and Recreation.

Parker, Patricia L., and Thomas F. King

1998 *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. National Park Service, Washington, D.C.

Pechanga Tribal Government

2015 Luiseño Ancestral Territory.

Pigniolo, Andrew R.

2004 Points, Patterns, and People: Distribution of the Desert Side-Notched Point in San Diego. *Proceedings of the Society for California Archaeology* 14:27–40.

2005 A Different Context: San Dieguito in the Mountains of Southern California. *Proceedings of the Society for California Archaeology* 18:247–254.

Robinson, Mark C.

2001 Units of Analysis. In *Metropolitan Water District of Southern California, Eastside Reservoir Project, Final Report of Archaeological Investigations, Volume IV: Prehistoric Archaeology Synthesis of Findings*, edited by Susan K. Goldberg, Chapter 4. Prepared by Applied Earthworks, Hemet, California for Metropolitan Water District of Southern California, Los Angeles.

Rogers, Malcom

1936 Yuman Pottery Making. *San Diego Museum Papers* No. 2.

1939 Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas. *San Diego Museum Papers* No. 3.

1966 *Ancient Hunters of the Far West*, edited by Richard F. Pourade, pp. 21-108. Copley Press, La Jolla, California.

Rolle, A.F.
1963 *California: A History*. Thomas Y. Crowell Company, New York, New York.

Rondeau, Michael F., James Cassidy, and Terry L. Jones
2007 Colonization Technologies: Fluted Projectile Points and the First Californians. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar. AltaMira Press, Lanham, Maryland.

Shipley, William F.
1978 Native Languages of California. In *California*, edited by Robert F. Heizer, pp. 80-90. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Sparkman, Philip Stedman
1908 The Culture of the Luiseño Indians. *University of California Publications in American Archaeology and Ethnology* 8(4):187-234.

Stine, Scott
1994 Extreme and Persistent Drought in California and Patagonia during Mediaeval Time. *Nature* 369:546–549.

Sutton, Mark Q., and Jill K. Gardner
2010 Reconceptualizing the Encinitas Tradition of Southern California. *Pacific Coast Archaeological Society Quarterly*, 42(4)1–64. Costa Mesa.

Sutton, Mark Q., and Donn R. Grenda
2012 Defining Level 1 at Malaga Cove (CA-LAN-138), Alta California. *California Archaeology* 4(1): 123–144.

Sutton, Mark Q., Mark E. Basgall, Jill K. Gardner, and Mark W. Allen
2007 Advances in Understanding Mojave Desert Prehistory. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 229–245. Alta Mira Press.

True, D.L.
1958 An Early Complex in San Diego County, California. *American Antiquity* 23(3):255–263.

1980 The Pauma Complex in Northern San Diego County: 1978. *Journal of New World Archaeology* 3(4):1–30. Institute of Archaeology, University of California, Los Angeles.

1990 Site Locations and Water Supply: A Perspective from Northern San Diego County, California. *Journal of New World Archaeology* 7(4):37–60.

True, D. L., and Paul D. Bouey
1990 Gladishill: A Probable San Dieguito Camp Near Valley Center, California. *Journal of New World Archaeology* 7(4): 1-28.

True, D.L., C.W. Meighan, and Harvey Crew
1974 *Archaeological Investigations at Molpa, San Diego County, California.* University of California Publications in Anthropology, Vol 11.

Vaughan, Sheila J.
1982 *A Replicative Systems Analysis of the San Dieguito Component at the C.W. Harris Site.* Master's thesis, Department of Anthropology, University of Nevada, Las Vegas.

Wallace, William J.
1955 A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11:214-230.

Warren, Claude N.
1966 *The San Dieguito Type Site: M. J. Rogers' 1938 Excavation on the San Dieguito River*. San Diego Museum Paper No. 6, San Diego, California.

1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32:168-185.

1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In *Archaic Prehistory in the Western United States*, edited by C. Irwin-Williams, pp. 1–14. Eastern New Mexico Contributions in Anthropology 1(3). Portales, New Mexico.

Warren, Claude N., and H.T. Ore
2011 The Age of the San Dieguito Artifact Assemblage at the C. W. Harris Site. *Journal of California and Great basin Anthropology* 31(1):81-97.

Warren, Claude N., and D.L. True
1961 The San Dieguito Complex and Its Place in San Diego County Prehistory. *Archaeological Survey Annual Report*, 1960-1961, pp. 246-291. University of California, Los Angeles.

Warren, Claude N., Gretchen Siegler, and Frank Dittmer
1998 Paleoindian and Early Archaic Periods. In *Prehistoric and Historic Archaeology of Metropolitan San Diego: A Historic Properties Background Study*. Draft report. Prepared for the Metropolitan Wastewater Department, City of San Diego. ASM Affiliates, Encinitas, California.

White, Raymond C.
1963 Luiseño Social Organization. *University of California Publications in American Archaeology and Ethnology* 48(2):91-194.

Wilke, Philip
1974 Settlement and Subsistence at Perris Reservoir: A Summary of Archaeological Investigations. In *Perris Reservoir Archaeology,* edited by James F. O'Connell, Philip J. Wilke, Thomas F. King, and Carol L. Mix, pp. 20–30. California Department of Parks and Recreation Reports No. 14. Sacramento.

1978 Late Prehistoric Human Ecology at Lake Cahuilla, Coachella Valley, California. *Contributions of the University of California Archaeological Research Facility 38*. University of California, Berkeley.

This page intentionally left blank

Appendix A

Resumes of Key Personnel

Trevor Gittelhough, RPA

Cultural Resources Assistant Project Manager

Summary of Qualifications

Trevor H. Gittelhough is an archaeological assistant project manager, specializing in underwater cultural resources, with over a decade of experience in archaeology, including both cultural resources management and academic projects. This experience includes site monitoring; surveys and excavations; laboratory sorting, cataloging, and analysis; and conservation. He has conducted environmental, paleontological, and cultural resources work throughout California, Nevada, Oregon, and Florida in support of compliance with California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA) and Sections 106 and 110 of the National Historic Preservation Act (NHPA) for public and private sector clients including a range of local, state, and federal agencies such as Southern California Edison, the United States Navy and Air Force, Caltrans, and FEMA.

He has experience in team management in the terrestrial and underwater archaeological management sectors, with expertise in implementation of mitigation and monitoring projects, report production, and coordination with Indigenous groups. Underwater and Indigenous archaeology are Mr. Gittelhough's specialties, which are enhanced by his skill and experience in sailing, diving, and prehistoric technology construction. His research interests include maritime technologies and practices, settlement patterns, trade and exchange, colonial interactions, prehistoric technologies, and anthropological/ archaeological theory. In addition, he has expertise in illustration of artifacts, stratigraphic and excavation unit profiles, site maps, GIS, remote sensing, and underwater excavation and mapping techniques.

Mr. Gittelhough's technical skills include terrestrial and submerged archaeological survey, excavation, and site testing. He has authored numerous site records and technical reports detailing the results of cultural resources work, as well as academic articles. He has also had thorough training in artifact analysis and specializes in lithic analysis and maritime conservation. His academic background includes advanced training in conservation and underwater archaeology. He has extensive training at the graduate level and earned his M.A. from East Carolina University. Mr. Gittelhough is Registered Professional Archaeologist, a member of the Society for American Archaeology (SAA), a member of the Society for Historical Archaeology (SHA), and a member of the Society for California Archaeology (SCA).

Selected Project Experience

Bouquet Canyon Road Project, Los Angeles County, CA (2021). Cultural Resource Specialist serving as lead archaeological monitor and technical report writer for this project in the City of Santa Clarita. This work included monitoring all ground-disturbing

Education

Master of Arts, Maritime Studies, East Carolina University, 2019

Bachelor of Arts, Archaeology, University of California, Santa Barbara, 2011

Registrations/ Certifications

Register of Professional Archaeologists, 2018

HAZWOPER Certification; 2018 – 2021

ESRI GIS Certification
AAUS Scientific Diver
Red Cross First AID
Red Cross CPR DAN Divers First Aid

Professional Affiliations

Society for American Archaeology
Society for Historical Archaeology
Society for California Archaeology

activities associated with geotechnical studies, such as drilling and trenching. Monitoring was also undertaken during ground penetrating radar studies of portions of the project area.

California Crossings, Attisha Trust Parcel, San Diego County, CA (2021). Cultural Resource Specialist for a cultural resources study in support of biological mitigation measures (burrowing owl habitat creation) for the proposed Project in the County of San Diego. Prepared an archaeological resources assessment in compliance with state and federal regulations. Scope included a cultural resources records search, review of historic maps and aerials, and preparation of a technical report.

Enchanted Hills Park Project, Perris, Riverside County, CA (2021). Cultural Resource Specialist for a monitoring program during initial sitework for this project in the City of Perris, in Riverside County. Prepared monitoring letter report.

Mission Basin Groundwater Purification Facility Well Expansion and Brine Minimization Project, Oceanside, San Diego County, CA (2021). Cultural Resource Specialist for a cultural resources study in support of the proposed Project in the City of Oceanside, in northern San Diego County. Prepared a monitoring results memo for monitoring of geotechnical investigations and assisted with preparation of the cultural resources technical report in compliance with state and federal regulations. Scope included a cultural resources records search, preparation of a letter report/memo, and assistance with the technical report.

Oak Shores/Lake Morena Views MWC Consolidation Project, San Diego County, CA (2021). Cultural Resource Specialist for a cultural resources study in support of the proposed Project in eastern San Diego County. Assisted with preparation of a cultural resources technical report in compliance with state and federal regulations, as well as State Water Resources Control Board. Scope included a cultural resources records search, review of historic maps and aerials, and assistance with preparation of a technical report.

Archaeological Monitoring for the P-586 Missile Assembly Building - San Nicolas Island, Ventura County, CA (2021). Cultural Resource Specialist serving as archaeological monitor and technical report writer. This work included monitoring all ground-disturbing activities, including grubbing, grading, and trenching. Monitoring included close involvement with United States Navy personal and Tribal Members and Observers.

Shady View Residential Project Environmental Impact Report, Chino Hills, San Bernardino County, CA (2021). Cultural Resource Specialist for a cultural resources study in support of the proposed Project in the City of Chino Hills in San Bernardino County. Assisted in the preparation of the technical report in compliance with state and federal regulations. Project scope included a cultural resources records search, review of historic maps and aerials, field survey, and preparation of a technical report.

Trevor Gittelhough, RPA

Cultural Resources Assistant Project Manager

Previous Project Experience

Los Angeles County Natural History Museum Center for History and Cultural Project, Los Angeles County, CA. Assistant Project Manager for a cultural resources study in support of the proposed Project in the downtown area of the City Los Angeles. Prepared an archaeological and tribal cultural resources assessment in compliance with CEQA, specifically Assembly Bill 52. Scope included a cultural resources records search, review of historic maps and aerials, and preparation of a technical study for submittal to the Department of City Planning.

Environmental Services Support for the Villages at The Alhambra Project, Los Angeles County, CA. Assistant Project Manager for a cultural resources study in support of the proposed Project in the downtown area of the City Los Angeles. Prepared an archaeological and tribal cultural resources assessment in compliance with CEQA, specifically Assembly Bill 52. Scope included a cultural resources records search, review of historic maps and aerials, and preparation of a technical study for submittal to the Department of City Planning.

Tierra Crossing Tribal Cultural Resource and Archaeological Assessment, Los Angeles, CA. Assistant Project Manager for a cultural resources study in support of the proposed Project in the downtown area of the City Los Angeles. Prepared an archaeological and tribal cultural resources assessment in compliance with CEQA, specifically Assembly Bill 52. Scope included a cultural resources records search, review of historic maps and aerials, and preparation of a technical study for submittal to the Department of City Planning.

Tribal Cultural Resources Assessment for the 17346 Sunset Project, Los Angeles, CA. Assistant Project Manager for a cultural resources study in support of the proposed Project in the downtown area of the City Los Angeles. Prepared a tribal cultural resources assessment in compliance with CEQA, specifically Assembly Bill 52. Scope included a cultural resources records search, review of historic maps and aerials, and preparation of a technical study for submittal to the Department of City Planning.

Mary Robbins-Wade, RPA

Cultural Resources Group Manager

HELIX Environmental Planning

Summary of Qualifications

Ms. Robbins-Wade has 41 years of extensive experience in both archaeological research and general environmental studies. She oversees the management of all archaeological, historic, and interpretive projects; prepares and administers budgets and contracts; designs research programs; supervises personnel; and writes reports. Ms. Robbins-Wade has managed or participated in hundreds of projects under the California Environmental Quality Act (CEQA), as well as numerous archaeological studies under various federal jurisdictions, addressing Section 106 compliance and National Environmental Policy Act (NEPA) issues. She has excellent relationships with local Native American communities and the Native American Heritage Commission (NAHC), as well as has supported a number of local agency clients with Native American consultation under State Bill 18 and assistance with notification and Native American outreach for Assembly Bill 52 consultation. Ms. Robbins-Wade is a Registered Professional Archaeologist (RPA) and meets the U.S. Secretary of the Interior's Professional Qualifications for prehistoric and historic archaeology.

Selected Project Experience

12 Oaks Winery Resort. Project Manager/ Principal Investigator for a cultural resources survey of approximately 650 acres for a proposed project in the County of Riverside. Oversaw background research, field survey, site record updates, Native American coordination, and report preparation. Met with Pechanga Cultural Resources staff to discuss Native American concerns. Worked with applicant and Pechanga to design the project to avoid impacts to cultural resources. Work performed for Standard Portfolio Temecula, LLC.

28th Street between Island Avenue and Clay Avenue Utilities Undergrounding Archaeological Monitoring. Project Manager/Principal Investigator for a utilities undergrounding project in a historic neighborhood of East San Diego. Responsible for project management; coordination of archaeological and Native American monitors; coordination with forensic anthropologist, Native American representative/Most Likely Descendent, and City staff regarding treatment of possible human remains; oversaw identification of artifacts and cultural features, report preparation, and resource documentation. Work performed for the City of San Diego.

Archaeological Testing F11 Project. Project Manager for a cultural resources study for a proposed mixed-use commercial and residential tower in downtown San Diego. Initial work included an archaeological records search and a historic study, including assessment of the potential for historic archaeological resources. Subsequent work included development and implementation of an archaeological testing plan, as well as construction monitoring and the assessment of historic archaeological resources encountered. Work performed for the Richman Group of Companies.

Education

Master of Arts, Anthropology, San Diego State University, California, 1990

Bachelor of Arts, Anthropology, University of California, Santa Barbara, 1981

Registrations/ Certifications

Caltrans, Professionally Qualified Staff-Equivalent Principal Investigator for prehistoric archaeology,

, Bureau of Land Management Statewide Cultural Resource Use Permit (California), permit #CA-18-35,

, Register of Professional Archaeologists #10294, 1991

County of San Diego, Approved CEQA Consultant for Archaeological Resources, 2007

, Orange County Approved Archaeologist, 2016

Blended Reverse Osmosis (RO) Line Project. Project Manager/ Principal Investigator for cultural resources monitoring during construction of a 24-inch recycled water pipeline in the City of Escondido. Oversaw monitoring program, including Worker Environmental Awareness Training; responsible for Native American outreach/coordination, coordination with City staff and construction crews, and general project management. Work performed for the City of Escondido.

Buena Sanitation District Green Oak Sewer Replacement Project. Project Manager/Principal Investigator for a cultural resources testing program in conjunction with a proposed sewer replacement project for the City of Vista. Oversaw background research, fieldwork, site record update, Native American coordination, and report preparation. Work performed for Harris & Associates, Inc., with the City of Vista as the lead agency.

Cactus II Feeder Transmission Pipeline IS/MND. Cultural Resources Task Lead for this project in the City of Moreno Valley. Eastern Municipal Water District proposed to construct approximately five miles of new 30-inch to 42 inch-diameter pipeline; the project would address existing system deficiencies within the City and provide supply for developing areas. Oversaw background research, field survey, and report preparation. Responsible for Native American outreach for cultural resources survey. Assisted District with Native American outreach and consultation under AB 52. Work performed under an as-needed contract for Eastern Municipal Water District.

Dale 2199C Pressure Zone Looping Pipeline Project. Cultural Resources Task Lead for this project in Moreno Valley. Eastern Municipal Water District proposed construction of a new pipeline to connect two existing pipelines in the District's 2199C Pressure Zone. The pipeline would consist of an 18-inch-diameter pipeline between Kitching Street and Alta Vista Drive that would connect to an existing 12-inch-diameter pipeline in the northern end of Kitching Street and to an existing 18-inch-diameter pipeline at the eastern end of Alta Vista Drive. The project will improve reliability and boost the Dale Pressure Zone's baseline pressure and fire flow availabilities. Four potential alignments were under consideration; three of these bisect undeveloped land to varying degrees, while the other is entirely situated within developed roadways. Oversaw background research and field survey. Responsible for Native American outreach for cultural resources survey and co-authored technical report. Work performed under an as-needed contract for Eastern Municipal Water District.

Downtown Riverside Metrolink Station Track & Platform Project. Cultural Resources Task Lead for this project involving changes to and expansion of the Downtown Riverside Metrolink Station. Overseeing records search and background information, archaeological survey, and report preparation. Responsible for coordination with Native American Heritage Commission, Riverside County Transportation Commission (RCTC), and Federal Transportation Authority (FTA) on Native American outreach. Work performed for Riverside County Transportation Commission as a subconsultant to HNTB Corporation.

Emergency Storage Pond Project. Project Manager/Principal Investigator for a cultural resources testing program in conjunction with the Escondido Recycled Water Distribution System - Phase 1. Two cultural resources sites that could not be avoided through project design were evaluated to assess site significance and significance of project impacts. Work included documentation of bedrock milling features, mapping of features and surface artifacts, excavation of a series of shovel test pits at each site, cataloging and analysis of cultural material recovered, and report preparation. The project is located in an area that is sensitive to both the Kumeyaay and Luiseño people, requiring close coordination with Native American monitors from both groups. Work performed for the City of Escondido.

Escondido Brine Line Project. Project Manager/Principal Investigator for cultural resources monitoring during construction of approximately 2.3 miles of a 15-inch brine return pipeline in the City of Escondido. The project, which is part of the City's Agricultural Recycled Water and Potable Reuse Program, enables discharge of brine recovered from a reverse osmosis facility that is treating recycled water; it is one part of the larger proposed expansion of Escondido's recycled water distribution to serve eastern and northern agricultural land. The project is located in an area that is sensitive to both the Kumeyaay and Luiseño people, requiring close coordination with Native American monitors from both groups. Oversaw monitoring program, including Worker Environmental Awareness Training; responsible for Native American outreach/coordination, coordination with City staff and construction crews, and general project management. Work performed for the City of Escondido.

Hacienda del Mar EIR. Senior Archaeologist for a proposed commercial development project for a senior care facility in Del Mar. Assisted in the preparation of associated permit applications and an EIR. Oversaw background research, updated records search and Sacred Lands File search, monitoring of geotechnical testing, coordination with City staff on cultural resources issues, and preparation of updated report. Prior to coming to HELIX, served as Cultural Resources Task Lead for the cultural resources survey for the project, conducted as a subcontractor to HELIX. Work performed for Milan Capital Management, with the City of San Diego as the lead agency.

Lilac Hills Ranch. Project Manager/Principal Investigator of a cultural resources survey and testing program for an approximately 608-acre mixed-use development in the Valley Center area. Oversaw background research, field survey, testing, recording of archaeological sites and historic structures, and report preparation. Responsible for development of the research design and data recovery program, preparation of the preservation plan, and Native American outreach and coordination. The project also included recording historic structures, development of a research design and data recovery program for a significant archaeological site, and coordination with the Native American community and the client to develop a preservation plan for a significant cultural resource. The project changed over time, so additional survey areas were included, and a variety of off-site improvement alternatives were addressed. Work performed for Accretive Investments, Inc. with County of San Diego as the lead agency.

Moulton Niguel Water District Regional Lift Force Main Replacement. Cultural Resources Task Lead/Principal Investigator for the replacement of a regional lift station force main operated by Moulton Niguel Water District (MNWD). The project comprises an approximately 9,200 linear foot alignment within Laguna Niguel Regional Park in Orange County, in an area that is quite sensitive in terms of cultural resources. HELIX is supporting Tetra Tech throughout the preliminary design, environmental review (CEQA), and final design, including permitting with applicable state and federal regulatory agencies. The cultural resources survey will inform project design, in order to avoid or minimize potential impacts to cultural resources. Oversaw background research and constraints analysis, Native American coordination, cultural resources survey, coordination with MNWD and Tetra Tech, and report preparation. Work performed for MNWD, as a subconsultant to Tetra Tech.

Murrieta Hot Springs Road Improvements Project. Principal Investigator/Cultural Resources Task Lead for cultural resources survey in support of an Initial Study/Mitigated Negative Declaration (IS/MND) for the widening of Murrieta Hot Springs Road in the City of Murrieta. The project would widen or restripe Murrieta Hot Springs Road between Winchester Road and Margarita Road from a 4-lane roadway to a six-lane roadway to improve traffic flow, as well as provide bike lanes in both directions along this segment. A new raised median, light poles, signage, stormwater catch basins, retaining walls, and sidewalks would also be provided on both sides of the roadway, where appropriate. The project area is in a location that is culturally sensitive to the Native American community. The cultural resources study included tribal outreach and coordination to address this cultural sensitivity.

Park Circle - Cultural Resources. Project Manager/Principal Investigator of a cultural resources survey and testing program for a proposed 65-acre residential development in the Valley Center area of San Diego County. The project is located along Moosa Creek, in an area that is culturally sensitive to the Luiseño people. Oversaw background research, historic study, field survey, testing, recording archaeological sites and historic structures, and report preparation. Responsible for Native American outreach and coordination. The cultural resources study included survey of the project area, testing of several archaeological sites, and outreach and coordination with the Native American community, as well as a historic study that addressed a mid-20th century dairy barn and a late 19th century vernacular farmhouse. Work performed for Touchstone Communities.

Peacock Hill Cultural Resources. Project Manager/Principal Investigator of a cultural resources study update for a residential development in Lakeside. Oversaw updated research, fieldwork, lab work, analysis by forensic anthropologists, report preparation, and Native American coordination. In the course of outreach and coordination with the Native American (Kumeyaay) community, possible human remains were identified, prompting additional fieldwork, as well as coordination with the Native American community and forensic anthropologists. Work performed for Peacock Hill, Inc.

Sky Canyon Sewer Environmental Consulting. Cultural Resources Task Lead for this project adjacent to the City of Murrieta in southwestern Riverside County. Eastern Municipal Water District (District) proposed to implement the Sky Canyon Sewer Main Extension Project to construct approximately 6,700 linear feet of new gravity-fed 36-inch-diameter sewer main to provide additional sewer capacity for planned development. The proposed 36-inch-diameter sewer main would extend the existing 36-inch-diameter French Valley Sewer at Winchester Road further downstream to Murrieta Hot Springs Road. Oversaw background research and field survey. Responsible for Native American outreach for cultural resources survey and co-authored technical report. Assisted District with Native American outreach and consultation under AB 52. Work performed under an as-needed contract for Eastern Municipal Water District.

Theodore G. Cooley, RPA

Senior Archaeologist

HELIX Environmental Planning

Summary of Qualifications

Mr. Cooley has over 45 years of experience in archaeological resource management. He has directed test and data recovery investigations, monitoring programs, and archaeological site surveys of large and small tracts, and has prepared reports for various cultural resource management projects. He is well-versed in National Historic Preservation Act, National Environmental Policy Act (NEPA), and California Environmental Quality Act (CEQA) regulations and processes. Mr. Cooley's experience also includes Native American consultation for monitoring of archaeological field projects, including some with human remains and reburial-related compliance issues.

Selected Project Experience

8016 Broadway Self Storage Project (2019 - Present). Senior Archaeologist for a Phase I pedestrian survey and cultural resource inventory program of the Lemon Grove Self-Storage project located in the City of Lemon Grove, San Diego County. Involvement included participation in the analysis of the results from the survey program and co-authorship of the technical report. Work performed for the Summit Environmental Group, Inc.

Briggs Road Walton Development Project (Assessor's Parcel Number 461-170-001) (2019 - Present). Senior Archaeologist for a Phase I pedestrian survey and cultural resource inventory program of the Briggs Road Residential project located in Riverside County. Involvement included participation in the analysis of the results from the survey program and co-authorship of the technical report. Work performed for the Walton International Group, LLC.

Brown Field and Montgomery Field Airport Master Plans (2019 - Present). Senior Archaeologist for Phase I cultural resource inventory and pedestrian survey programs at the Brown Field Municipal Airport and the Montgomery-Gibbs Executive Airport, in the City of San Diego, in support of updating of the Airport Master Plan and its Programmatic Environmental Impact Report. Involvement included participation in the analysis of the results from the survey programs and co-authorship of the technical reports. Work performed as a subconsultant to C&S Companies, with the City of San Diego as the lead agency.

Cubic Redevelopment Environmental Consulting (2019 - Present). Senior Archaeologist for a Phase I pedestrian survey and cultural resource inventory and assessment program in support of a 20-acre redevelopment project, located in the community of Kearny Mesa, City of San Diego. Involvement included participation in the analysis of the results from the survey program and preparation of the technical report. Work performed for Cubic Redevelopment Environmental Consulting, with the City of San Diego as lead agency.

Education

Master of Arts, Anthropology, California State University, Los Angeles, 1982

Bachelor of Arts, Anthropology, California State College, Long Beach, 1970

Registrations/ Certifications

Register of Professional Archaeologists #10621, 2019

City of San Diego, Certified Principal Investigator for Monitoring Projects

County or Riverside, Certified Cultural Resources Consultant Principal Investigator

County of Orange, Certified Cultural Resources Consultant Principal Investigator

County of San Diego, Approved Consultant for Archaeological Resources

Los Angeles, Ventura, San Luis Obispo, and Santa Barbara Approved Consultant

Theodore G. Cooley, RPA
Senior Archaeologist

French Valley 303 Project (2019 - Present). Senior Archaeologist for an archaeological construction monitoring program for the French Valley 303 Site residential development project, located in the French Valley area of unincorporated Riverside County. Involvement included participation in the analysis of the results from the monitoring program and co-authorship of the technical report. Work performed for Pulte Home Co., LLC.

Hiser Property Project (2019 - Present). Senior Archaeologist for a due diligence study prepared to summarize potential cultural resources constraints to the 9.2-acre Hiser Property development project, located in the Mission Gorge area of the City of Santee, San Diego County. The study consisted of background research including a record search and limited archival study, a field survey, and a review of the Sacred Lands File from the Native American Heritage Commission (NAHC). Involvement included participation in the analysis of the results and preparation of a summary letter report of the potential cultural resources-related constraints to the planned development. Work performed for KB Home.

Ponto Hotel Technical Studies (2019 - Present). Senior Archaeologist for a cultural resources assessment study for the Ponto Hotel development project in the City of Carlsbad, San Diego County, California. Involvement included participation in the analysis of the results from the assessment program and preparation of the technical report. Work performed for Kam Sang Company, with the City of Carlsbad as the lead agency.

R.M. Levy Water Treatment Plant Sewer Replacement (2019 - Present). Senior Archaeologist for a Phase I pedestrian survey and cultural resource inventory and assessment program in support of a water treatment plant, sewer pipeline, replacement project, located in the community of Lakeside, San Diego County. Involvement included participation in the analysis of the results from the survey program and preparation of the technical report. Work performed for HELIX Water District.

Salt Bay District Specific Plan EIR (2019 - Present). Senior Archaeologist for a Phase I pedestrian survey and cultural resource inventory program in support of the 46.6-acre Salt Bay Design District Specific Plan mixed-use wholesale/retail shopping and light industrial development project, in the cities of San Diego and Chula Vista. Involvement included participation in the analysis of the results from the survey program and co-authorship of the technical report. Work performed for M. & A. Gabaee, with the City of San Diego as lead agency.

San Jacinto Property Project (2019 - Present). Senior Archaeologist for a Phase I pedestrian survey and cultural resource inventory program of the 214 residential project located in Riverside County. Involvement included participation in the analysis of the results from the survey program and co-authorship of the technical report. Work performed for the Walton International Group, LLC.

San Elijo Joint Powers Authority Roadway and Trail Addendum and Permitting (2019 - Present). Senior Archaeologist for Phase I cultural resource inventory, pedestrian survey, and resource testing at the San Elijo Water Reclamation Facility adjacent to San Elijo lagoon, in San Diego County, in support of the preparation by the San Elijo Joint Powers Authority of a Roadway and Trail Addendum for upgrades to the facility requiring verification of Nationwide Permit authorization from the U.S. Army Corps of Engineers (USACE). Involvement included participation in the analysis of the results from the survey and testing program and co-authorship of the technical report. Work performed as a subconsultant to Kimley-Horn & Associates, with the San Elijo Joint Powers Authority as lead agency.

Sycamore & Watson Project (2019 - Present). Senior Archaeologist for an archaeological construction monitoring program for the Sycamore & Watson residential development project, located in City of Vista, San Diego County. Involvement included participation in the analysis of the results from the monitoring program and preparation of the technical report. Work performed for Meritage Homes.

Sycamore Canyon/Goodan Ranch Public Access Plan IS/MND (2019 - 2019). Senior Archaeologist for Phase I pedestrian survey and cultural resource inventory in support of the preparation by the County of San Diego County Parks Department of a Public Access Plan for the Sycamore Canyon/Goodan Ranch Preserve located in coastal foothills of unincorporated west-central San Diego County. Involvement included participation in the analysis of the results from the survey program and co-authorship of the technical report. Work performed for the County of San Diego.

Sycuan/Sloane Canyon Trail IS/MND (2019). Senior Archaeologist for Phase I pedestrian survey and cultural resource inventory in support of the preparation by the County of San Diego County Department of a Parks and Recreation for the Sycuan/Sloane Canyon Trail project located in the coastal foothills of unincorporated southwestern San Diego County. Involvement included participation in the analysis of the results from the survey program and co-authorship of the technical report. Work performed for the County of San Diego.

The Enclave at Delpy's Corner Project (2019 - Present). Senior Archaeologist for a cultural resources monitoring and data recovery program in support of a proposed 124-unit townhome development project, in the City of Vista, San Diego County. Involvement included participation in the analysis of the prehistoric lithic artifacts and preparation of technical report sections containing the results of these analyses. Work performed for CalAtlantic Homes.

Julie A. Roy

Archaeologist

HELIX Environmental Planning

Summary of Qualifications

Ms. Roy has over 20 years of experience as an archaeologist, field lead, and supervisor on more than 130 projects throughout California, Nevada, Arizona, and Guam. Conducted archaeological studies for a wide variety of development and resource management projects including work on military installations, energy and transmission projects, commercial and residential developments, historic archaeology projects, and water projects. Competent in all areas of archaeology and efficient in report preparation for a range of cultural resource studies including monitoring projects and archaeological Phase I, II and III studies. Ms. Roy is proficient in laboratory activities including artifact preparation, cataloging, identification, and illustration. Accomplished in the initiation, coordination and completion of field assignments including survey, site testing, dry and wet screening, and data recovery projects. She is also knowledgeable in the preparation of proposals and report writing and research, client, contractor and subcontractor correspondence, laboratory, computer software including Microsoft, Adobe, Geographic Information System (GIS)/ArcView, Computer-Aided Design and Drafting (CADD), Global Positioning System (GPS) and total-station operations, as well as in the illustration of archaeological features, artifacts, and burials. Ms. Roy is established as a qualified archaeological monitor for the City and the County of San Diego. Her experience includes working closely with representatives of San Diego County Parks and Recreation for the past 10 years and she has received accolades from numerous county representatives for her work at park facilities. For the past 4 four years, she has served as the monitoring coordinator for the San Diego Gas & Electric Company (SDG&E) Fire Resource Mitigation Initiative (FiRM) project, where she regularly provided effective communication between field monitors, construction managers/foremen, and Principal Investigators for construction projects and assisted in scheduling and tracking of project progress.

Selected Project Experience

Blythe to Eagle Mountain TLRR Survey (2017). Field Director on this Southern California Edison (SCE) Survey project, which included supervising two crews during a period of two weeks. Conducted survey, mapping, recording new cultural resources and updating previously recorded sites along the transmission line corridor. Other responsibilities included report writing and completion of site records for distribution to SCE and the South Coastal Information Center (SCIC).

On-call Archaeological Services (Present). Archaeologist and Field Lead for SDG&E infrastructure operations and transmission line maintenance activities for over 12 years. Projects include survey, testing, excavations, and data recovery of both historic and prehistoric resources including Native American burial sites. Approved to monitor for City projects throughout San Diego and Imperial counties. Other duties include records search, survey, archaeological documentation and investigations, and

Education

Master of Arts, Archaeology, University of Leicester, England, In progress

Bachelor of Arts, Anthropological Archaeology, University of California San Diego, 2002

Associate of Arts, **P**sychology, San Diego City College, 2000

Registrations/ Certifications

OSHA 30-hour Construction Safety Training Certification

Competent Person Certification

Professional Affiliations

Society for California Archaeology

Society for American Archaeology

Association of Environmental Professionals preparation of reports under California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) guidelines.

Fire Resource Cultural Resources Mitigation (Present). Monitoring Coordinator and Lead Archaeologist on this FiRM project for SDG&E. Monitoring Coordinator duties consist of close communication with SDG&E supervisors and staff, liaisons, and contractors in conjunction with the coordination of FiRM project activities associated with cultural and Native American archaeological and monitoring efforts throughout San Diego and Imperial Counties. Archaeological Supervisor duties consists of record search, survey, archaeological site documentation, testing, excavations, and data recovery projects, and preparing reports following CEQA and NEPA guidelines.

Archaeological Monitoring, Bird Rock Avenue Utility Undergrounding Project (2005). Archaeological Monitor for the undergrounding of residential utilities in the Bird Rock community of La Jolla. The project was conducted under CEQA and the City of San Diego guidelines while working closely with San Diego Gas and Electric Company and the construction contractor. No cultural resources were identified during this project.

Archaeological Monitoring and Data Recovery, Princess Street Utility Undergrounding Project (2005 - 2006). Archaeological Monitor/Crew Chief for utility undergrounding project, which included trenching through a major prehistoric and ethnohistoric Indian village site (the Spindrift Site/CA-SDI-39) in La Jolla. Crewmembers worked closely with Native American representatives during the recovery of human remains. A concurrent data recovery program incorporated all cultural material recovered from the trenching activities. This project was conducted pursuant to CEQA and City of San Diego guidelines while working closely with San Diego Gas & Electric Company and the construction contractor.

Environmental Impact Statement, Southern Nevada Supplemental Airport (2007 - 2009). Archaeologist on this project that included survey and recordation of the northern portion of Ivanpah Valley from the California state line to Henderson, Clarke County, Nevada. Cultural sites located within the project area included a section of the pacific railroad, historic roads, camps, railroad and construction debris, transmission lines, trash scatters and prehistoric sites and features. The project was surveyed and recorded in compliance with the Nevada State Historic Preservation Office (SHPO) and Bureau of Land Management (BLM) guidelines.

Monitoring, Genesis Solar Power Project (2011 - 2012). Supervisor-in-Charge of over 20 cultural monitors on this solar power project located in Blythe, California. Responsible for conducting safety meetings and coordinating cultural monitors to all areas of the project site, as well as leading test excavations of discovered resources during construction activities. Also responsible for representing firm during onsite meetings with Nextera officials, Bureau of Veritas, BLM, and safety liaisons for the project. Communicated directly with Native American supervisors and monitors on a daily basis. Recorded and collected artifacts located during construction activities with the use of Global Positioning Satellite technology. Completed daily field notes and collection logs for all collected artifacts, and reviewed all staff monitoring logs prior to daily submission to the California Energy Commission (CEC). Work performed for Nextera.

Survey and Monitoring, Palen Solar Power Project (2009 - 2010). Archaeologist for survey and cultural monitoring in Desert Center, California. Monitored contract and personnel activities during traveling to and from proposed project sites, including trenching and testing within the proposed project areas. Work performed for Solar Millennium.

Ridgecrest Solar Power Project (2009 - 2010). Archaeologist for surveys of the project area undertaken to determine if cultural resources are present and if there would be any project effects on these resources. Monitored contractor activities during the testing phase of the project to ensure that sites were not impacted during work activities. The project was located in Ridgecrest and work was performed for Solar Millennium.

On-Call Archaeological Services (Present). Archaeologist and Field Lead for County Parks infrastructure and maintenance activities for San Diego County Department of Parks and Recreation. Responsible for communication with County supervisors and contractors, and the coordination of project activities with cultural and Native American monitors for projects throughout San Diego and Imperial Counties. Other duties include records search, field survey, archaeological documentation and investigations including testing, excavations and data recovery projects and preparation of reports following CEQA and NEPA guidelines.

Pacifica Street Utility Undergrounding Project (2006). Archaeological Monitor/Crew Chief for residential utility undergrounding project in the community of Pacific Beach in San Diego. Trenches and cultural materials were documented in conjunction with a concurrent data recovery program. The project included working with Native American representatives and the discovery of human remains. The project was conducted under CEQA and City of San Diego guidelines while working closely with the construction contractor.

Archaeological Monitoring, 20A Julian Conversion Project (2006). Archaeological Monitor for undergrounding of utilities in the City of Julian. The project was conducted under the County of San Diego guidelines while working closely with the construction contractor.

Data Recovery, Hill Street Utility Undergrounding Project (2006). Archaeological Monitor participated in the data recovery for this residential utility undergrounding project in the community of Point Loma in San Diego. The project was conducted under CEQA and City of San Diego guidelines while working closely with the construction contractor.

Archaeological Monitoring, 30th Street Utility Undergrounding Project (2006). Archaeological Monitor for residential utility undergrounding project in the community of South Park in San Diego. The project was conducted under CEQA and City of San Diego guidelines while working closely with the construction contractor.

IS/MND Appendix D

Geotechnical Study

ALBUS-KEEFE & ASSOCIATES, INC
GEOTECHNICAL CONSULTANTS

April 28, 2020
J.N.: 2485.02

Mr. Craig Mazzara
Sr. Project Manager
Van Daele Development Corporation
2900 Adams St. Suite C-25
Riverside, CA 92504

Subject: **Geotechnical Design Report for Proposed Construction of Second Tank (Quail Valley Tank III) at the Existing Quail Valley II Tank Site, City of Menifee, Riverside County, California.**

Dear Mr. Mazzara,

Pursuant to your request, ***Albus-Keefe & Associates, Inc***. is pleased to present to you our geotechnical design report for the proposed construction of a second tank (Quail Valley Tank III) at the existing Quail Valley II Tank site. This report presents the results of our review of our previous geotechnical reports for the site, engineering and geologic analyses, and conclusions and recommendations pertaining to proposed site development as indicated on the rough grading plans.

We appreciate this opportunity to be of service to you. If you should have any questions regarding the contents of this report, please do not hesitate to call.

Sincerely,

ALBUS-KEEFE & ASSOCIATES, INC.

Michael O. Spira
Principal Engineering Geologist

1011 North Armando Street, Anaheim CA 92806-2606 (714) 630-1626 FAX (714) 630-1916

TABLE OF CONTENTS

REPORT

TABLE OF CONTENTS (CONTINUED)

FIGURES AND PLATES

APPENDICES

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of our geotechnical design report was to provide specific recommendations for design and construction of the proposed Quail Valley III Tank as depicted on the referenced site improvements plans. The scope of this investigation included the following:

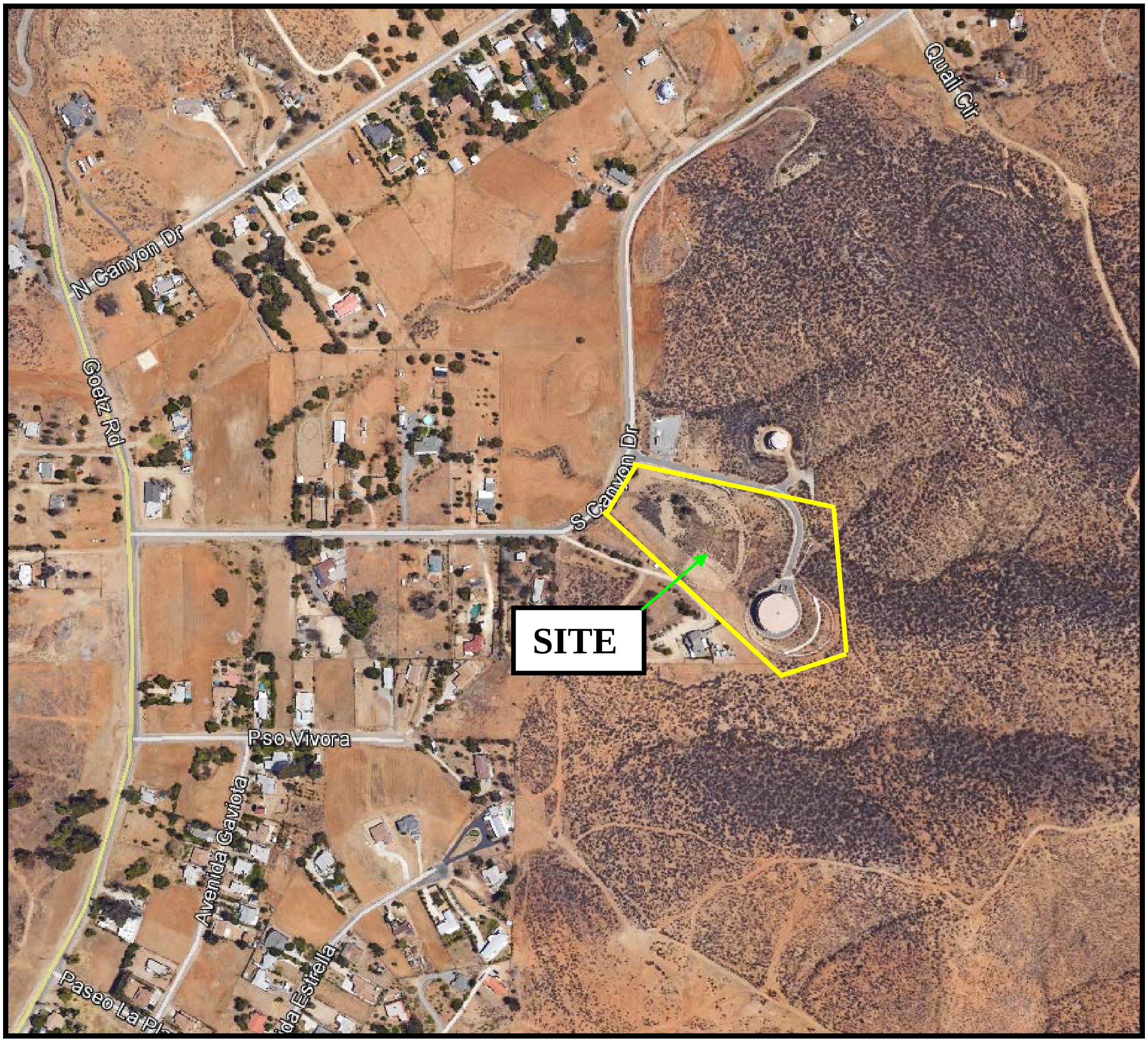
- Review of our previous geotechnical reports for the site
- Review of the referenced site improvements plans
- Engineering and geologic analyses
- Preparation of this report.

1.2 SITE LOCATION AND DESCRIPTION

The proposed new tank will be constructed at the existing Quail Valley II Tank site located in the City of Menifee, Riverside County. In closer proximity, the site is located southeast of Canyon Drive, approximately 1,600 feet west of the intersection of Canyon Drive and Goetz Road. The site is bounded by Canyon Drive to the northwest, by a rural residential development to the southwest and south, by vacant land to the east and by an existing water tank site to the north. The location of the site and its relationship to the surrounding area is shown on Figure 1, Site Location Map.

The site comprises approximately 5 acres of land and is currently occupied by an aboveground water reservoir (referred to as the Quail Valley II tank) with a capacity of 1.8 million gallons and a service road. The existing tank is located on a cut pad excavated into the ridgeline within the upper southeasterly corner of the site. Cut slopes associated with the cut pad are at a slope ratio of 1.5:1(h:v) or flatter to a maximum height of approximately 44 feet. In addition to the tank, a level graded fill pad with an associated access road is located in the south-central margin of the site. Fill slopes associated with the level graded pad and access roads are at a slope ratio of 2:1 (h:v) or flatter to a maximum height of approximately 30 feet. A small segmental retaining wall is also present along the access road to the fill pad. The undeveloped portions of the site are generally characterized as gently- to moderately-inclined hillside property.

Surface runoff within the site is generally directed down the hillside to a west-draining swale and then is directed off site beneath Canyon Drive via a corrugated steel storm drain pipe. Vegetation within the undeveloped portions of the site and the graded pad consists primarily of sparse grasses and low shrubs. Some scattered trees are also located within the low-lying westerly portion of the site.



N

SITE LOCATION MAP

Quail Valley II Tank Site
(Alternate 2 Location)
Canyon Heights Area
Riverside County, California

NOT TO SCALE

FIGURE 1

1.3 PLAN REVIEW AND PROPOSED DEVELOPMENT

Based on the referenced Quail Valley III Tank Site Improvements plans prepared by Adkan Engineers, the new tank would be positioned 56 feet west of the existing tank. The new tank would be supported on a fill pad at the same elevation as the existing tank, at an elevation of 1772 feet (MSL). A detention basin is also proposed west of the graded tank pad. The location and configuration of the new tank pad and the detention basin are depicted on the attached Geotechnical Map, Plate 1.

Proposed site grading for the new tank pad will generally involve fill placement up to 40 feet in maximum thickness to achieve the desired pad grade. Fill slope construction is also indicated at a 2:1 gradient or flatter up to a maximum height of roughly 55 feet. Proposed site grading for the detention basin will primarily involve cuts up to 19 feet in maximum depth and some minor fill placement up to 2.5 feet in maximum thickness. Cut slopes are indicated at a 2:1 gradient or flatter up to a maximum height of roughly 26 feet. Earthwork quantities shown on the plans indicate that 26,636 cubic yards of imported fill will be required to achieve proposed grades. Based on our previous study, we understand the required import material for the site will likely be generated from local developments.

Based on correspondences with the tank designer, PACE Advanced Water Engineering, we understand the tank will have a maximum capacity of approximately 1.8 million gallons (MG) with a working capacity of 1.63 MG. The tank dimensions will be 101 feet in diameter and up to 37 feet in wall height. However, the maximum fluid height inside the tank will only be 30' feet.

The proposed tank will have a welded steel shell and be supported by a concrete ring footing. Project plans indicate the ring wall footing will be 3 feet wide and 3 feet thick. We have been informed this footing would be subjected to maximum bearing pressure of 2,400 psf under seismic loading but the static pressure was not provided. We also have been informed the current configuration of the tank will utilize only one central interior column to support the roof structure. We have been provided with vertical load of 110 kilo pounds (kps) for this central column. However, interior columns maybe required based on finalized structural calculations.

We respect to settlement, we have been informed that a total settlement of 4.0 inches and differential settlement of 1 to 2 inches between the center of the tank and the edge of tank would be within the tolerable limits.

1.4 PREVIOUS GEOTECHNICAL WORK

The Quail Valley II Tank site was initially investigated by this firm in 2002 in association with the Canyon Heights Project (Tract No. 30330). Our investigation largely involved field mapping and the excavation and logging of 6 exploratory trenches up to 5 feet in depth and 5 exploratory borings up to 48 feet in depth. The exploratory trenches were excavated using a rubber-tire backhoe. An air-tract drill rig was utilized to excavate the borings for the purpose of evaluating rock hardness. Logs of test pits and laboratory testing pertaining to our previous site investigation (Albus-Keefe 2002) are provided in Appendix A. Logs for the 5 borings were not prepared and as such are not included. A subsequent grading plan review report was completed by this firm on August 6, 2003.

Later in 2004, the site was graded to its current configuration under the observation and testing of this firm. Although, a formal report was never produced at the completion of rough grading operations, the rough grading of the site generally involved site clearing and grubbing operations, removal of unsuitable earth materials, fill placement operations, fill and cut slope construction, storm drain installation, and segmental retaining wall construction. Where necessary, fill slope construction involved fill key construction and subdrain installation. Onsite soils placed within the site were generated from onsite cuts. The compaction criteria for the onsite soils placed within the site was a minimum of 90% of ASTM D 1557.

In April 2017, this firm completed a geotechnical feasibility investigation in support of a second aboveground water reservoir tank on a fill pad at the Quail Valley II Tank site. This investigation, dated April 7, 2017, largely involved soil sampling of onsite soils and soils from potential import sites, laboratory testing, and analyzing total and differential settlement of the tank due to loading from the shell, loading from the tank contents, and long-term consolidation of the fill due to self-weight. At the time, the tank capacity was 1.8 Million Gallons (MG) and a tank diameter of 114 feet. Based on our previous analysis, the estimated total and differential settlement was found to be within tolerable limits for a steel-shell storage tank. Pertinent laboratory test results from this study are provided in Appendix B.

In March 2019, this firm reassessed static settlement and tank interactions based on a smaller tank with a capacity of 1.63 million gallons (MG) and a diameter of 100 feet. The results of this previous analysis were provided in our referenced report, dated March 8, 2019.

2.0 GEOLOGIC CONDITIONS

2.1 GEOLOGIC UNITS

Geologic units beneath the site consist predominately of Jurassic-age metasedimentary rocks assigned to the Bedford Canyon Formation (Jbc). Within the undeveloped portions of the site, the bedrock is generally mantled by surficial units consisting of topsoil and colluvium. Compacted artificial fill materials associated with the development of the Quail Valley II Tank site in 2004 are also present over much of the developed portions of the site. The distribution of the geologic units, based largely on our previous investigation work and rough grading, is indicated on the enclosed Geotechnical Map, Plate 1 and reflected in the Geologic Cross-Sections, Plate 2. Detailed descriptions of each of the units are provided in our referenced report dated April 7, 2017 and remain applicable. The previous discussion from that report is reiterated in the following sections.

2.1.1 Compacted Artificial Fill (Qcaf)

Compacted artificial fill materials associated with previous site grading of the reservoir site in 2004 generally underlies the service road to the existing tank pad and underlies the level graded pad and associated access road in the south-central margin of the site. The compacted artificial fill materials were generally derived from onsite earth materials and are generally comprised of brown sand silt with gravel to silty gravel with various amounts of cobbles. These materials are damp to moist and dense. Based on in-place density testing during rough grading, the relative compaction of the artificial fill materials placed with the site varies from 90% to 92%. The thickness of compacted artificial fill materials beneath the site varies from as little as a foot to up to approximately 25 feet at the far north corner of the level graded pad area in the south-central margin of the site.

2.1.2 Topsoil (no map symbol)

A poorly- to moderately-developed topsoil mantles most of the bedrock beneath the undeveloped portions of the site. The topsoil materials generally consist of brown sandy silt and silty gravel with various amounts of cobbles. These materials are dry to damp, soft and/or loose, porous and contain roots. The thickness of the topsoil varies from as little as half a foot to 2 feet.

2.1.3 Colluvium (Qcol)

Colluvial soil deposits are present within the bottom of drainage swale that extends through the lower central portion of the site. These deposits are produced by the accumulation of soil and weathered bedrock debris that has moved down slope by the process of creep and erosion. In general, the colluvial soil deposits consist of brown sandy silt and silty gravel with various amounts of cobbles and boulders. These deposits are dry to damp, soft and/or loose, and are porous. The thickness of the colluvial soil deposits encountered varies from 3 feet to 4.5 feet.

2.1.4 Bedrock; Bedford Canyon Formation (Jbc)

Metasedimentary rocks assigned to the Jurassic age Bedford Canyon Formation underlies the entire site and are exposed in the cut slope associated with the existing tank pad. The metasedimentary rocks consist primarily of light brown fine-grained quartzite. The bedrock is generally hard to very hard, moderately weathered, poorly foliated, and highly to moderately fractured.

2.2 GEOLOGIC STRUCTURE

2.2.1 Foliation and Joints

Based on our initial investigative work and our as-built mapping during construction, the foliation, structure observed in the bedrock generally strikes northwest and dips steeply to the northeast. Joints in the bedrock generally occur in three sets; one set that generally strikes northeast and dips at low to moderate angles to the northwest roughly parallel to topography (exfoliation joints), one set that generally strikes northwest and dips steeply to the northeast, and one set that strikes northeast and dips steeply to the northwest and southeast. The joints are typically tight and are closely to medium spaced. Block sizes are typically 8” or less in maximum dimension. The foliation and joint orientations are indicated on the Geologic Map, Plate 1.

2.2.2 Faulting

Evidence of faulting within and adjacent the site was not encountered during our previous investigations nor during rough grading of the site. Based on our review of the referenced publications and seismic data, no active faults are known to project through the site and the site does not lie within an "Earthquake Fault Zone" as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act.

Several large active fault systems are located in relative close proximity to the site. Seismic activity on these fault systems has for the most part controlled the geologic structure in the region. Table 3.1

presents a summary of known active faults within 10 miles of the site based on the 2008 USGS National Seismic Hazard Maps.

2.3 LANDSLIDES

No evidence of landslides was identified within or adjacent the subject site during our previous investigations or during rough grading of the site.

TABLE 3.1
Summary of Active Faults

Name	Distance (miles)	Slip Rate (mm/yr.)	Preferred Dip (degrees)	Slip Sense	Rupture Top (km)	Fault Length (km)
Elsinore;GI	6.05	5	90	strike slip	0	37
Elsinore;W+GI	6.05	n/a	81	strike slip	0	83
Elsinore;W+GI+T+J	6.83	n/a	84	strike slip	0	199
Elsinore;W+GI+T	6.83	n/a	84	strike slip	0	124
Elsinore;GI+T+J	6.83	n/a	86	strike slip	0	153
Elsinore;GI+T	6.83	5	90	strike slip	0	78
Elsinore;GI+T+J+CM	6.83	n/a	86	strike slip	0	195
Elsinore;W+GI+T+J+CM	6.83	n/a	84	strike slip	0	241
Elsinore;T+J+CM	7.14	n/a	85	strike slip	0	169
Elsinore;T+J	7.14	n/a	86	strike slip	0	127
Elsinore;T	7.14	5	90	strike slip	0	52

2.4 GROUNDWATER

Groundwater was not encountered during our previous investigations or during rough grading of the site. Groundwater is anticipated to be present at significant depth below the site.

3.0 ANALYSES

3.1 TANK SETTLEMENT

3.1.1 General

Analyses were performed to estimate total and differential settlement of the tank due to loading from the shell, loading from the tank contents, and long-term consolidation of the fill due to self-weight. The fills and bedrock underlying the tank are anticipated to be granular in nature. As such, we have modeled the materials as exhibiting elastic behavior. Settlement analyses make use of one-dimensional consolidation theory but make considerations for 3-dimensional effects. Stress distribution from the tank loading was based on a Bousinesq distribution. The following sections provide more in-depth discussion on the assumptions, selection of parameters, and methods of analyses.

3.1.2 Elastic Parameters for Fills and Bedrock

Estimates of elastic modulus (Es) of existing and new fill materials were primarily based on correlations of the modulus to the N_{60} blow count which in turn, is related to the relative density of the material. The analyses also made use of a correlation between relative density (Dr) and relative compaction (RC) since the compaction of fill materials is based on relative compaction rather than relative density.

Holtz and Gibbs (1979) proposed the following relationship between RC and Dr:

RC = 80% + 0.2Dr (for Dr > 40%)

Assuming the new planned fill will have a minimum RC of 95%, the above relationship resulted in a Dr = 75%. Our records indicate the existing fill was placed with a relative compaction of at least 90%. The above relationship resulted in a Dr = 50% for the existing fill having a RC=90%.

Several relationships are available for the purpose of estimating N_{60} from the relative density. Among these, equation 3-3b of US Army Corps of Engineers Engineering Manual EM 1110-1-1905 (1992) was used:

$$D_r = 100\sqrt{\frac{N_{60}}{60}} \qquad \Rightarrow \qquad N_{60} = 0.006 D_r^2 \text{ (for Dr > 35 percent)}$$

In the above, Dr is in percent (e.g., should use 50 for Dr = 50%). Using the values of Dr estimated above, this equation resulted in N_{60} = 34 and N_{60} = 15 for the planned fill (with Dr = 75%) and the existing fill (with Dr = 50%), respectively.

The elastic modulus (Es) of new and existing fill was then estimated from correlations with N_{60}. Several correlations have been proposed to relate Es to N_{60}. Among these, Equation 7.17 by Coduto (2001) provides conservative values of Es and was adopted for our analyses. The proposed equations by Coduto is presented below:

$$E_s = \beta_0 \sqrt{OCR} + N_{60}\ \beta_1$$

In this equation, OCR is overconsolidation ratio. OCR=1.0 was used in our analyses. This is a conservative assumption particularly for the upper few feet of the proposed fill, where during compaction process, the fill experiences stresses that are greater than those applied to it even after filling the tank. β_0 and β_1 are constants. For silty sand soil (that is anticipated to compose the proposed fill as well as the existing fill), the above reference recommends β_0 = 50 ksf and β_1 = 12 ksf. As result, Es = 450 ksf and Es = 230 ksf were calculated for the new fill and the existing fill, respectively.

Table 3.1 summarizes the values assumed in computing Es for fills. Because the above process involves conservative assumptions in several stages, the computed values of Es are deemed conservative, producing upper bound estimates of settlement. For comparison, by using the ranges of elastic moduli recommended for given ranges of relative density in Table 5-5 of EPRI (1990), values of Es greater than three times those estimated in this section will be obtained.

TABLE 3.1
Summary of Elastic Moduli of Fills

Material	Minimum Relative Compaction, RC (%)	Relative Density, Dr (%)	Elastic Modulus, Es (ksf)
Proposed New Fill	95	75	450
Existing Fill	90	50	230

The elastic modulus for the underlying bedrock was assumed conservatively and consistent with our previous work for the existing tank as reflected in the referenced grading plan review report (Albus-Keefe 2003). From this previous work, Es = 1,000 ksf was assumed at the top of bedrock, increasing at a rate of 20 ksf per 1 foot of depth. An additional level of conservatism was introduced by limiting elastic modulus of rock to 2,500 ksf.

3.1.3 Validation of Elastic Modulus of the Proposed Fill using Lab Test Results

The estimated elastic modulus of the proposed new fill was verified by results of a consolidation test on a remolded sample of potential import soil. The test results were used to estimate the constrained modulus of the remolded fill soil by measuring the ratio of stress over strain for the appropriate stress range. The proposed new fills are anticipated to vary from 12 to 37 feet in thickness. Based on this range, we used a thickness of 15 feet to represent the initial stress conditions in the center of the fill mass. By using a unit weight of 130 pcf for compacted fill (approximating 95% of maximum dry density + optimum moisture content), the initial vertical stress would be 1,950 psf. The tank foot print will apply a pressure of 1,900 psf, that includes both the fluid pressure due to a maximum content height of and the floor plate weight. Therefore, the maximum final stress will be 1,950 + 1,900 = 3,850 psf. Measuring the ratio of stress over strain in the consolidation plot between the stresses of 1,950 psf and 3,850 psf, we obtain a stain of about 0.3% over 2,000 psf. This corresponds to a constrained modulus of about 670 ksf.

Using Poisson's ratio of 0.3 typically recommended for silty sand, a conversion factor of 0.74 should be applied to constrained modulus to obtain the elastic modulus. As a result, we obtain an elastic modulus of E=490 ksf. This value is reasonably close to the value of 450 ksf suggested by the approach discussed in Section 3.1.2. In the areas closer to the center of the tank, the condition of the underlying fill is closer to the constrained condition (similar to that in consolidation test, where soil is constrained from lateral movement). Therefore, these areas are better represented by constrained modulus (e.g., 670 ksf), implying that the use of elastic modulus (E = 450 ksf) for these areas is conservative.

Based on the gradation test results of Plates B-1 and B-2 (Attachment B), sample S-3 on which the consolidation test was performed contains more fines than other samples, thus demonstrating greater compressibility and smaller elastic modulus. Therefore, the above elastic modulus (estimated from consolidation test results) represents the smallest anticipated value, and the actual values in the field would likely be greater. Furthermore, following the referenced standard for consolidation test (ASTM D 2435), this test was performed on the fraction of the soil sample passing sieve #4. However, at least 10 percent of the soil particles were greater than this size (Curve S-3, Plate B-1) and will contribute to a greater elastic modulus in the field. In conclusion, the consolidation test result verifies the elastic modulus of E = 450 ksf is an appropriate but conservative design value.

3.1.4 Elastic Settlement From Tank Loads

Analyses were performed to estimate static settlement due to the ring wall footing load, weight of the tank contents, and load from the center column. We used the Bousinesq relationships to calculate the stress distribution for settlement calculations at the center of the tank and at the edge of the tank. As discussed previously, the ring wall footing is 3 feet wide and 3 feet thick. Half of the width of the footing is subjected to the same fluid pressure as the rest of the pad (i.e., 1,900 psf). In addition, the shell of the tank and the portion of the roof weight tributary to the ring footing add additional load to the ring footing. Considering all these loads, we estimate the footing will apply an equivalent uniform bearing pressure of about 1,500 psf due to dead loads. As stated above, the tank pad area will be subjected to a maximum static bearing pressure of 1,900 psf, that includes both fluid pressure due to a maximum content height of 30 feet and the floor plate weight. The tank pad pressure and ring footing bearing pressure are close enough to allow modeling the ring footing as an extension of the tank pad diameter. As a result, settlement analyses considering the fluid weight and ring footing load were based on a loaded area with a diameter of 101 + 3 = 104 feet, subjected to uniform bearing pressure of 1,900 psf. The center column was modeled as a total vertical load of 110 kips supported by a 10ft x 10ft rigid footing.

As indicated in cross sections A-A' and B-B' on Plate 2, the thicknesses of the planned (new) fill, thickness of existing fill, and the depth to the top of bedrock vary throughout the footprint of the tank. Settlement at the edges of the tank was evaluated by examining multiple edge points labeled as A1, A2, B1, and B2 shown on Plate 1 and Plate 2. These four points were considered to represent the range of conditions around the tank edge. The one-dimensional subsurface profile indicated on the cross sections was used for each point analyzed. Printouts of the worksheets showing details of settlement calculations are provided on Plates C-1 through C-6 in Appendix C. Results of settlement analyses are summarized in Table 3.2

Table 3.2
Summary of Static Settlements

Load Condition/ Point of Interest	Thickness of Layer within the Pressure Zone under Tank			Settlement in the Area of the Tank			Total Settlement	Differential Settlement (Center-to-Edge of Tank)
	New Fill (ft)	Existing Fill (ft)	Rock (ft)	Only In New Fill (in)	Only In Existing Fill (in)	Only In Rock (in)	(in)	(in)
Footing Load								
Center of Tank	23	0	0	0.14	0.00	0.00	**0.14**	N/A
Fluid Load								
Center of Tank	24	6	164	1.19	0.54	0.75	**2.47**	N/A
A1	14	0	165	0.34	0.00	0.50	**0.84**	**1.78**
A2	34	4	141	0.77	0.15	0.38	**1.30**	**1.31**
B1	19	0	160	0.45	0.00	0.47	**0.93**	**1.69**
B2	19	15	145	0.45	0.66	0.39	**1.50**	**1.11**

3.1.5 Long-Term Fill Settlement

Long term (secondary) settlement of the new fill under self-weight was estimated using the coefficient of secondary compression (Cα) based on NAVFAC 7.01 (1986). Secondary settlement is calculated using the following equation:

$$\rho_s = C_\alpha H_t \, log\left(\frac{t_{sec}}{t_p}\right)$$

Where H_t is total thickness of the new fill, t_p is time to completion of primary settlement (assumed completion of the construction of fill, 6 months) and t_{sec} is time of useful life (assumed 50 years). The fill was assumed to have a moisture content of about 11.5% based on a typical optimum moisture of 9.5%. This moisture yielded a secondary coefficient of consolidation equal to 0.00115. Details of secondary settlement calculations are provided on Plate C-7 in Appendix C. The results of our analyses are also summarized in Table 3.3.

Table 3.3
Summary Long Term Settlements

Point of Interest	New Fill Thickness (ft)	Secondary Settlement (in)
Center of Tank	24	0.66
A1	14	0.39
A2	34	0.94
B1	19	0.52
B2	19	0.52

3.1.6 Adjacent Tank Stress Interaction

Based on the plans available to us, the minimum edge-to-edge spacing between the outside wall of the existing tank (No. 2) and that of the proposed tank (No. 3) is 57.5 feet. With ring footings extending 2 feet and 1.5 feet beyond the shells of the existing and the proposed tanks, respectively, the edge-to-edge spacing of the loaded areas from these two tanks is 54 feet. The zone under a tank that experiences change in pressure due to tank's bearing pressure (referred to as pressure zone) is not limited to the footprint of the tank. This raises the possibility for overlap of the pressure zones of two adjacent tanks causing mutual interaction. To evaluate the potential for interaction, we established the limits of the zone that represented 10% of the applied load from the tank. Portions of the soil mass subjected to less than 10% of the applied load were assumed to have negligible influence on settlement of the tanks. The standard Bousinesq stress distribution for circularly-loaded areas was used to determine the limits of the 10% stress increase as depicted on the cross section of Plate C-8. This cross section indicates that a relatively limited zone almost halfway between the center of the two tanks and between depths 39 to 156 feet is impacted by overlap of the stress zones of the two tanks. This overlap zone is entirely within the bedrock. Since the overlap is relatively limited and occurs entirely within the low compressibility bedrock, any associated settlement due to the overlapping stress zones is deemed negligible.

4.0 CONCLUSIONS

4.1 FEASIBILITY OF PROPOSED DEVELOPMENT

From a geotechnical point of view, the subject site is considered feasible for the development of a new water storage tank. Geotechnical issues deemed relevant to the establishment of feasibility are discussed in the following sections. Specific design parameters and recommendations will be required to develop construction documents for the project. Such design recommendations can be provided in a future geotechnical report.

4.2 SEISMIC HAZARDS

4.2.1 Ground Rupture

No active faults are known to project through the site nor does the site lie within the bounds of an "Earthquake Fault Zone" as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act. As such, the potential for ground rupture due to a fault displacement beneath the site is considered remote.

4.2.2 Ground Shaking

The site is situated in a seismically active area that has historically been affected by generally moderate to occasionally high levels of ground motion. The site lies in relative close proximity to several active faults; therefore, during the life of the proposed improvements, the property will probably experience similar moderate to occasionally high ground shaking from these fault zones, as well as some background shaking from other seismically active areas of the Southern California region. Design and construction in accordance with current design practices and codes are anticipated to adequately mitigate issues related to potential ground shaking.

4.2.3 Liquefaction

Engineering research of soil liquefaction potential (Youd, et al., 2001) indicates that generally three basic factors must exist concurrently in order for liquefaction to occur. These factors include:

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

The site could be subjected to strong ground shaking and the site is underlain by layers of granular soils. However, all materials within the influence of the proposed site development are anticipated to be adequately dense to greatly reduce the risks associated with liquefaction. In addition, current and future groundwater levels are anticipated to remain at great depth such that soils within the influence of the proposed tank are not expected to become saturated. As such, risks associated with liquefaction are considered remote.

4.2.4 Seiches and Tsunami

The site is elevated more than 1705 feet above sea level and is located a substantial distance from a significant body of water within an enclosed basin. As such, the potential for hazards related to seiches and tsunami are considered remote.

4.3 GROUNDWATER

Based on our previous investigations, groundwater is likely located at great depth well below the site. Furthermore, the proposed detention basin will only be intermittently filled for limited periods of time and, therefore, should not result in an elevated groundwater condition beneath the site. As such, groundwater is not anticipated to impact proposed site development.

4.4 STATIC SETTLEMENT

Details of settlement analyses are discussed in Section 3.1 and are summarized in Table 4.1. This summary table shows estimates of both instantaneous settlement due to the weight of tank and its fluid content, as well as long-term secondary consolidation of the new fill under self-weight. As indicated by the summary table, the estimated maximum total settlement is 3.3 inches and occurs at the center of the tank. The estimated smallest settlement is 1.2 inches occurring along the edge at Point A1. The estimated maximum differential settlement is 2.1 inches occurring between the tank center and the edge at Point A1..

TABLE 4.1
Summary of Tank Settlement

Point of Interest	**Total Fill Thickness**	**Settlements**			
		Instantaneous (Elastic)	**Long Term Secondary**	**TOTALS (Instantaneous + Long-Term)**	
		(in)	**(in)**	**Total (in)**	**Differential (in)**
Center of Tank	30	2.6	0.7	**3.3**	N/A
A1	14	0.8	0.4	1.2	**2.1**
A2	38	1.3	0.9	2.2	1.1
B1	19	0.9	0.5	1.4	1.9
B2	34	1.5	0.5	2.0	1.3

The tolerable limits indicated by the structural engineer are up to 4 inches total and up to 2 inches differential. Although the calculated maximum differential settlement exceeds the maximum allowable by 0.1 inches, we consider the compounding conservative assumptions made in the analyses to justify the conclusion that actual differential settlement will be less than 2 inches. Therefore, the estimated total and differential settlements are considered within tolerable limits

The settlements were calculated by assuming the existing fill is retained in place. Accordingly, we conclude the existing fill can remain in place other than recompaction of the near-surface soils that are likely weathered. The analyses also assume that new fill will be placed at a minimum relatively compaction of 95% of ASTM D1557.

As discussed in Section 3.1.6, the stress interaction between the existing tank and new tank are anticipated to be negligible. As such, we conclude settlement of the existing tank induced by the construction and operation of the new tank is anticipated to be negligible.

4.5 SLOPE STABILITY

Results of previous engineering analyses, as part of our previous report (Albus-Keefe 2003), and our previous experience with similar materials indicate the proposed 2 to 1 (H:V) fill at their maximum slope heights are anticipated to be grossly stable under static and seismic conditions. Results of our previous analyses also indicate that cut slopes in the bedrock formation having a maximum gradient of 1.5 to 1 (H:V) are anticipated to be grossly stable.

Significant portions of the site materials and suitable import materials are anticipated to be relatively cohesionless. As such, many of the constructed fill slopes will be prone to surficial erosion during periods of rain. Permanent vegetation is anticipated to provide adequate mitigation for long-term erosion protection. Until permanent vegetation is established, slopes will likely require short-term erosion protection such as jute matting, polymer applicants, or other suitable methods as may be recommended by a landscape architect.

Based on previous experience with similar materials, temporary excavations in soils made at a gradient of 1 to 1 (H:V) will provide a factor of safety greater than 1.25 for heights up to 15 feet. Vertical cuts in bedrock up to a height of 10 feet and ½ to 1 (H:V) cuts in bedrock up to 15 feet will provide a factor of safety greater than 1.25.

4.6 SHRINKAGE AND BULKING

The volume change of excavated materials upon recompaction is expected to vary with material types, in-situ density, and compaction effort. Based on our experience with similar projects, the following estimates of shrinkage and bulking are summarized in Table 4.2 below. Subsidence due to recompaction of exposed removal bottoms is anticipated to be negligible.

TABLE 4.2
Estimates of Shrinkage and Bulking

MATERIAL	VOLUME CHANGE	SHRINKAGE/BULKING
Topsoil (no map symbol) Colluvium (Qcol)	10% to 15%	Shrinkage
Bedrock (Jbc) (upper 1 foot to 2 feet)	0% to 10%	Bulking
Bedrock (Jbc) (Below 2 feet)	10% to 20%	Bulking

The estimates of shrinkage, bulking, and subsidence are intended as an aid for project engineers in determining earthwork quantities. However, these estimates should be used with some caution since they are not absolute values. Contingencies should be made for balancing earthwork quantities based on actual shrinkage and bulking that occur during the grading.

4.7 EXCAVATION AND MATERIAL CHARACTERISTICS

Based on our previous subsurface exploratory work and site grading, as well as our experience on similar sites, the surficial deposits such as the topsoil, colluvium and artificial fills are anticipated to be relatively easy to excavate with conventional heavy earthmoving equipment. However, excavations within the bedrock will likely require heavy ripping with a Caterpillar D-9 with a single shank. Conventional trenching equipment will generally not be able into excavate relatively hard bedrock materials.

The site earth materials are generally considered suitable for reuse as fill provided they are cleared of deleterious debris. Some oversize rock (over 8 inches in maximum dimension) will also likely be generated from cuts in locally less fractured zones in the bedrock and from excavations in the surficial deposits. The oversize rock will require special handling in a manner as described in Section 5.1.8 of this report.

Cuts into the bedrock materials may produce a limited amount of fines and a high percentage of rock fragments. Therefore, conservation of finer soil materials will be required for mixing with rock fragments as described in Section 5.1.7 of this report.

5.0 RECOMMENDATIONS

5.1 EARTHWORK

5.1.1 General Earthwork and Grading Specifications

All earthwork and grading should be performed in accordance with all applicable requirements of CALOSHA and the Grading Code of the County of Riverside, California, in addition to recommendations presented herein.

5.1.2 Pre-Grade Meeting and Geotechnical Observation

Prior to commencement of grading, we recommend a meeting be held between the owner, grading contractor, civil engineer, paleontologist/archeologist, and geotechnical consultant, to discuss proposed work and logistics.

We also recommend that a geotechnical consultant be retained to provide soil engineering and engineering geologic services during site grading. This is to observe compliance with the design specifications or recommendations, and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction. If conditions are encountered during construction that appears to be different than those indicated in this report, the project geotechnical consultant should be notified immediately. Design and construction revisions may be required.

5.1.3 Site Clearing and Demolition

All vegetation and other deleterious materials should be removed from the site. The project geotechnical consultant should be notified at the appropriate times to provide observation services during clearing and demolition operations to verify compliance with the above recommendations. Voids created by clearing should be left open for observation by the geotechnical consultant. Should any unusual soil conditions or subsurface structures be encountered during site clearing and/or grading that are not described or anticipated herein, these conditions should be brought to the immediate attention of the project geotechnical consultant for corrective recommendations.

5.1.4 Ground Preparation

All existing topsoil, colluvium, weathered and/or disturbed compacted artificial fills, and weathered bedrock materials are considered unsuitable for support of proposed structural fills and site development. These materials should be removed through excavation or benching to expose competent compacted artificial fills and bedrock. Estimated depths of unsuitable materials, based on subsurface exploration conducted by this firm, as well as this firm's experience with similar sites, are indicated on the Geologic Map, Plate 1.

Exploratory trenches previously excavated by this firm were backfilled without compaction. Backfill materials for these trenches, where located within areas of site development, should be removed and replaced as compacted fill.

All removals should be evaluated by the geotechnical consultant during grading to confirm the exposed conditions are as anticipated and to provide supplemental recommendations if required.

5.1.5 Temporary Excavations

Temporary excavations in soil materials, including trench excavations and retaining wall backcuts, may be cut vertically up to a height of 4 feet provided that no adverse geologic conditions or surcharging of the excavations are present. Temporary excavations in soil materials that are greater than 4 feet but less than 15 feet in height should be laid back at a maximum gradient of 1:1 (H: V). If temporary excavations greater than 15 feet in depth are required in soil materials, the project geotechnical consultant should provide specific recommendations based on proposed work and site conditions.

Temporary excavations in bedrock materials may be cut vertically up to a height of 10 feet provided that no adverse geologic conditions or surcharging of the excavations are present. Temporary excavations in bedrock materials that are greater than 10 feet in height should be laid back at a maximum gradient of 1/2:1 (H:V). If cuts in bedrock create a rock fall hazard for workers, the excavation should be laid back as recommended by the project engineering geologist or soil engineer.

The project geologist or soil engineer should observe all temporary cuts to confirm that conditions are as anticipated herein and to provide specific recommendations in the event conditions differ. All temporary excavations should conform to the requirements of CAL OSHA.

5.1.6 Scarification

Prior to placement of compacted fill, the prepared ground should be scarified where practical to a depth of 6 inches, brought to a uniform moisture content of generally in the range of 100 to 110 percent of optimum, then compacted to at least 90 percent of the laboratory standard. If the ground surface exposes rock that has been disturbed and contains voids, a 6-inch layer of granular soil should be placed over the ground surface and flooded until the voids are filled.

5.1.7 Fill Placement

The materials excavated from the site may be used as fill provided they are free of deleterious materials and particles greater than 8 inches in maximum dimension except the upper 5 feet of the tank pad. Fill materials to be placed within the upper 5 feet of the tank pad and at least 5 feet beyond the outside edge of the proposed ring footing should be free of deleterious materials and not contain rock fragments greater than 4 inches. Due to the potential for significant quantities of rocky material, all fills should be well graded by consisting of finer and coarse materials. The fills should contain sufficient finer granular materials to eliminate nesting of rock fragments. Fill materials that in the opinion of the Geotechnical Consultant do not contain sufficient finer particles, should be blended with additional finer materials until the material is well graded and is acceptable to the Geotechnical Consultant.

Fill materials should be placed in lifts no greater than approximately 8 inches in thickness. Each lift should be watered or air dried as necessary to achieve a uniform moisture content of 100 to 110 percent of optimum, and then compacted in place to at least 95 % of ASTM D1557. Each lift should be treated in a similar manner. Subsequent lifts should not be placed until the project geotechnical consultant has approved the preceding lift. Lifts should be maintained relatively level and should not exceed a gradient of 20 to 1 (H:V). When placing fill on ground sloping steeper than 5:1 (H:V), vertical benches should be excavated into the adjacent slope. Typical benching details are provided on Plates D-1 and D-2.

The laboratory standard for maximum dry density and optimum moisture content for each change in soil type should be determined in accordance with Test Method ASTM D 1557-91.

5.1.8 Over-sized Material

Rock fragments over 8 inches in diameter should be reduced in size, where practical, and incorporated within the fill materials provided they are mixed with granular materials and spread throughout the fill to eliminate nesting. Materials greater than 8 inches that cannot be reduced in size should be removed from the site.

5.1.9 Fill slopes

Fill slopes (fill over natural slopes, fill over cut slopes) should be constructed with a keyway having a minimum width of 15 feet and a minimum embedment of 2 feet into competent bedrock. Details for fill slope construction are presented on Plate D-1.

Where practical, fill slopes should be constructed by over-filling and trimming to a compacted core. The face of slopes that are not over-built should be backrolled with a sheepsfoot roller at least every

4 vertical feet of slope construction. The process should provide compacted fill to within 12 inches of the slope face. Finished slopes should be track-walked with a small dozer in order to compact the slope face. The slope face materials will tend to dry out prior to final face compaction. As such, the addition of water to the slope face will likely be required prior to compaction to achieve the required degree of compaction at the time of slope face compaction.

5.1.10 Cut Slopes

Cut slopes should be carefully inspected at intervals not exceeding 10 feet during grading by an engineering geologist, to evaluate the competency of the slope. Heavy ripping should be designed in a manner as to minimize disturbing the bedrock below proposed slope grades. Cut slopes that are undercut and/or expose adverse geologic conditions may require replacement with stabilization fill slopes. However, specific recommendations should be provided by the geotechnical consultant under such conditions.

5.1.11 Slope Backdrains

Slope backdrains are generally recommended in all new fill key excavations. In addition, the existing subdrain outlets from the subdrains placed in the fill key excavation during the initial grading of the building pad should be extended to the new slope face. The locations and necessity of slope backdrains will be determined by the project geotechnical consultant in the field during rough grading. General details for slope backdrains are presented in Appendix D, Plate D-2.

5.1.12 Import Material

Import soils will be required to achieve proposed grades. The proposed import soils should have an Expansion Index (EI, ASTM D 4829) less than 20 and possess negligible soluble sulfate concentrations. Based on previous settlement analyses, the import soils should also meet the gradation criteria presented in Table 5.1 below. Several local sources were previously assessed during our feasibility study, dated April 7, 2017, and were found to be generally suitable. However, prior to hauling the materials to the site, the import sources should be indicated to the geotechnical consultant so that appropriate testing and evaluation of the fill material can be performed in advance to confirm our previous findings.

TABLE 5.1
Gradation Requirement for Import Fill

Particle Size	Percent Passing
6”	100
¾”	75-100
No. 4	50-100
No. 40	20-55
No. 200	10-35
0.01 mm	<10

5.2 PRELIMINARY RESERVOIR FOUNDATION DESIGN RECOMMENDATIONS

5.2.1 General

Recommendations presented herein are based typical site materials exposed during our previous investigation and our experience with similar projects in the vicinity. As such, these recommendations are preliminary in nature and subject to possible modifications. The project geotechnical consultant should provide final recommendations following observation and testing of site materials during grading. These recommendations assume the tank shell will be supported by a concrete ring footing supported on compacted fill. If a different type of foundation is used these recommendations will be subject to revision.

5.2.2 Allowable Bearing Value

Provided site grading is performed as recommended herein, a bearing value of 3,000 pounds per square foot may be used for continuous footings having a minimum width of 18 inches and founded at a minimum depth of 24 inches below the lowest adjacent grade. Recommended allowable bearing values include both dead and live loads, and may be increased by one-third for wind and seismic forces.

5.2.3 Lateral Resistance

A passive earth pressure of 200 pounds per square foot per foot of depth up to a maximum value of 1000 pounds per square foot may be used to determine lateral bearing for footings. This value may be increased by one-third when designing for wind and seismic forces. A coefficient of friction of 0.36 times the dead load forces may also be used between concrete and the supporting soils to determine lateral sliding resistance. No increase in the coefficient of friction should be used when designing for wind and seismic forces.

The above values are based on footings placed directly against compacted fill. In the case where footing sides are formed, all backfill against the footings should be compacted to at least 95 percent of the laboratory standard.

5.2.4 Foundation Settlement

Design of the tank foundation and shell should take into consideration the estimated settlements discussed in Section 3.1.

5.2.5 Concrete Mix Design

Laboratory testing of on-site soils indicates soluble sulfate content less than 0.1%. We recommend following the procedures provided in ACI 318, Section 4.3, Table 4.3.1 for exposure S0. Upon completion of rough grading, an evaluation of as-graded conditions and further laboratory testing should be completed for the site to confirm or modify the recommendations provided in this section.

5.2.6 Corrosion Potential

Previous testing for chloride levels in site soils does not indicate a corrosive environment to ferrous metals. However, site soils do indicate a minimum resistivity less than 4000 ohm-cm and a slightly acidic condition. As such, site soils are moderately corrosive to ferrous metals. Structures fabricated from steel or other ferrous metals should have appropriate corrosion protection if they will be in contact with site soils. Under such conditions, a corrosion specialist should provide specific recommendations.

5.2.7 Tank Subgrade and Underlainment

Prior to placement of the underlainment system and tank, the subgrade soils should be compacted to at least 95% of ASTM D-1557.

Specific recommendations for the underlainment system have not been developed at this time pending details of the tank design. Specific recommendations should be provided by this office when foundation plan have been prepared. The underlainment system should include a blanket drain below the tank bottom.

5.2.8 Seismic Design Parameters

We have performed probabilistic seismic analyses per ASCE7-16 utilizing the U.S. Seismic Design Maps accessed through the Applied Technical Council (ATC) web application. From our analyses, we obtain a PGA of 0.582g. The site coefficient, F_{PGA}, for this range of PGA and site class C is 1.2. Therefore, the site modified peak ground acceleration is PGA_M = 1.2 x 0.582 = 0.70g. The mean event associated with a probability of exceedance equal to 2% over 50 years has a moment magnitude of 6.87 with a mean distance to the seismic source of 8.9 miles.

For design of the project in accordance with Chapter 16 of the 2019 CBC, the following table presents the seismic design factors:

TABLE 5.2
2019 CBC Seismic Design Parameters

Parameter	Value
Site Class	C
Risk Category	III & IV
Mapped MCE Spectral Response Acceleration, short periods, S_S	1.448
Mapped MCE Spectral Response Acceleration, at 1-sec. period, S_1	0.531
Site Coefficient, Fa	1.2
Site Coefficient, Fv	1.469
Adjusted MCE Spectral Response Acceleration, short periods, S_{MS}	1.738
Adjusted MCE Spectral Response Acceleration, at 1-sec. period, S_{M1}	0.78
Design Spectral Response Acceleration, short periods, S_{DS}	1.159
Design Spectral Response Acceleration, at 1-sec. period, S_{D1}	0.52
Seismic Design Category (SQD)	D
MCE = Maximum Considered Earthquake	

5.2.9 Footing Observations

All footing trenches should be observed by the project geotechnical consultant to verify that they have been excavated into competent bearing soils and to the minimum embedment recommended herein. These observations should be performed prior to placement of forms or reinforcement. The excavations should be trimmed neat, level and square. All loose, sloughed or moisture softened materials and debris should be removed prior to placing concrete.

5.3 EXTERIOR FLATWORK DESIGN

Concrete sidewalks and similar flatwork should be a nominal 4 inches thick and provided with saw cuts or expansion joints at spacing no greater than 10 feet in each direction. Special jointing details should be provided in areas of block-outs, notches, or other irregularities to avoid cracking at points of high stress.

Drainage from flatwork areas should be directed to local area drains and/or other appropriate collection devices designed to carry runoff water to the street or other approved drainage structures. The concrete flatwork should also be sloped at a minimum gradient of 0.5% away from building foundations and masonry walls.

Subgrade soils below flatwork areas should be thoroughly moistened prior to placing concrete. The moisture content of the soils should be at least 100 percent of the optimum moisture content and penetrate to a depth of approximately 12 inches into the subgrade. Flooding or ponding of the subgrade is not recommended. Moisture conditioning should be achieved by a light application of water to the subgrade just prior to pouring concrete.

5.4 PRELIMINARY PAVEMENT DESIGN

The preliminary pavement design criteria presented in Table 5.3 are based on previous R-value testing of the soil materials present at the site and assumed Traffic Indexes. Final pavement design sections should be determined by the project soil engineer based on R-value testing of actual subgrade soils at the completion of rough grading and Traffic Indexes determined by the project civil engineer or County of Riverside.

TABLE 5.3
Preliminary Pavement Design

Location	Assumed T.I.	A.C. (inches)	A.B. (inches)
Access Road	6.5	3	6

A.C. = Asphalt Concrete, A.B. = Class 2 Aggregate Base

5.4.1 Subgrade Preparation

Prior to placement of pavement elements, the upper 12 inches of subgrade soils should be moisture-conditioned to at least 110 percent of the optimum moisture content and compacted to at least 90 percent of the laboratory standard. Areas observed to pump or yield under vehicle traffic should be removed and replaced with firm and unyielding compacted soil or aggregate base materials.

5.4.2 Aggregate Base

Aggregate base should be moisture conditioned to slightly over the optimum moisture content, placed in lifts no greater than 6 inches in thickness, then compacted to at least 95 percent of the laboratory standard (ASTM D 1557). Aggregate base materials should be Class 2 Aggregate Base conforming to Section 26-1 of the Caltrans Standard Specifications, Crushed Aggregate Base conforming to Section 200-2.2 of the Standard Specifications for Public Works Construction (Greenbook) or Crushed Miscellaneous Base conforming to Section 200-2.4 of the Greenbook.

5.4.3 Asphaltic Concrete

Aggregate base Paving asphalt should be PG 64-10 conforming to the requirements of Section 203-1 of the Greenbook. Asphalt concrete materials should conform to Section 203-6 and construction should conform to Section 302 of the Greenbook.

5.5 POST GRADING CONSIDERATIONS

5.5.1 Site Drainage

Positive drainage devices, such as sloping concrete flatwork, graded swales, and/or area drains, should be provided around the new construction to collect and direct all water to a suitable discharge area. No rain or excess water should be allowed to pond against building walls or foundations.

5.5.2 Utility Trenches

Trench excavations should be constructed in accordance with the recommendations contained in Section 5.1.5 of this report. All trench excavations should conform to the requirements of CAL OSHA.

All utility trench backfill should be compacted to at least 90 percent of the laboratory standard. Trench backfill should be brought to a uniform moisture content of 100 to 130 percent of optimum, placed in lifts no greater than 12 inches in thickness, and then mechanically compacted with appropriate equipment to at least 90 percent of the laboratory standard. The project geotechnical consultant should perform density testing, along with probing, to verify adequate compaction.

Within shallow trenches (less than 18 inches deep) where pipes may be damaged by heavy compaction equipment, imported clean sand having a Sand Equivalent of 30 or greater may be utilized. The sand should be placed in the trench, thoroughly watered, and then compacted with a vibratory compactor. Jetting in lieu of mechanical compaction may be considered.

5.5.3 Erosion Protection of Slopes

As previously discussed in Section 4.5, significant portions of the site materials and suitable import materials are anticipated to be relatively cohesionless. As such, slope constructed of these materials will be prone to erosion during periods of rain. Until permanent vegetation is established, slopes should be provided short-term erosion protection such as jute matting, polymer applicants. Specific recommendations for erosion should be provided by the project landscape architect.

5.6 PLAN REVIEW AND CONSTRUCTION SERVICES

We recommend *Albus-Keefe & Associates, Inc*. be engaged to review any modifications made to the grading plans and to review foundation plans prior to construction. This is to verify that the recommendations contained in this report have been properly interpreted and are incorporated into the project specifications and to provide detailed recommendations. If we are not provided the opportunity to review these documents, we take no responsibility for misinterpretation of our conclusions and recommendations.

We recommend that a geotechnical consultant be retained to provide soil engineering services during construction of the project. These services are to observe compliance with the design, specifications or recommendations, and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

If the project plans change significantly, the project geotechnical consultant should review our original design recommendations and their applicability to the revised construction. If conditions are encountered during construction that appears to be different than those indicated in this report, the project geotechnical consultant should be notified immediately. Design and construction revisions may be required.

6.0 LIMITATIONS

This report is based on the proposed development and geotechnical data as described herein. The materials encountered on the project site and utilized in our laboratory testing during our previous investigations are believed representative of the total project area, and the conclusions and recommendations contained in this report are presented on that basis. However, soil and bedrock materials can vary in characteristics between points of exploration, both laterally and vertically, and those variations could affect the conclusions and recommendations contained herein. As such, observation and testing by a geotechnical consultant during the grading and construction phases of the project are essential to confirming the basis of this report.

This report has been prepared consistent with that level of care being provided by other professionals providing similar services at the same locale and time period. The contents of this report are professional opinions and as such, are not to be considered a guaranty or warranty.

This report should be reviewed and updated after a period of one year or if the site ownership or project concept changes from that described herein.

This report has been prepared for the exclusive use of the **Van Daele Development Corporation** and their project consultants in the planning and design of the proposed development. This report has not been prepared for use by parties or projects other than those named or described herein. This report may not contain sufficient information for other parties or other purposes.

This report is subject to review by the controlling governmental agency.

Respectfully submitted,

ALBUS-KEEFE & ASSOCIATES, INC.

David E. Albus
Principal Engineer
G.E. 2455

Michael O. Spira
Principal Engineering Geologist
C.E.G. 1976

REFERENCES

Reports

Albus-Keefe & Associates, 2019, Static Settlements and Tanks Interaction, Proposed Second Aboveground Water Reservoir Tank Pad at the Quail Valley II Tank Site, Canyon Heights Area, Riverside County, California, dated March 8, 2019 (J.N. 2485.02).

Albus-Keefe & Associates, 2017, Geotechnical, Feasibility Investigation in Support of a Second Aboveground Water Reservoir Tank Pad at the Quail Valley II Tank Site (Alternate 2 Location), Canyon Heights Area, Riverside County, California, dated April 7, 2017 (J.N. 2485.01).

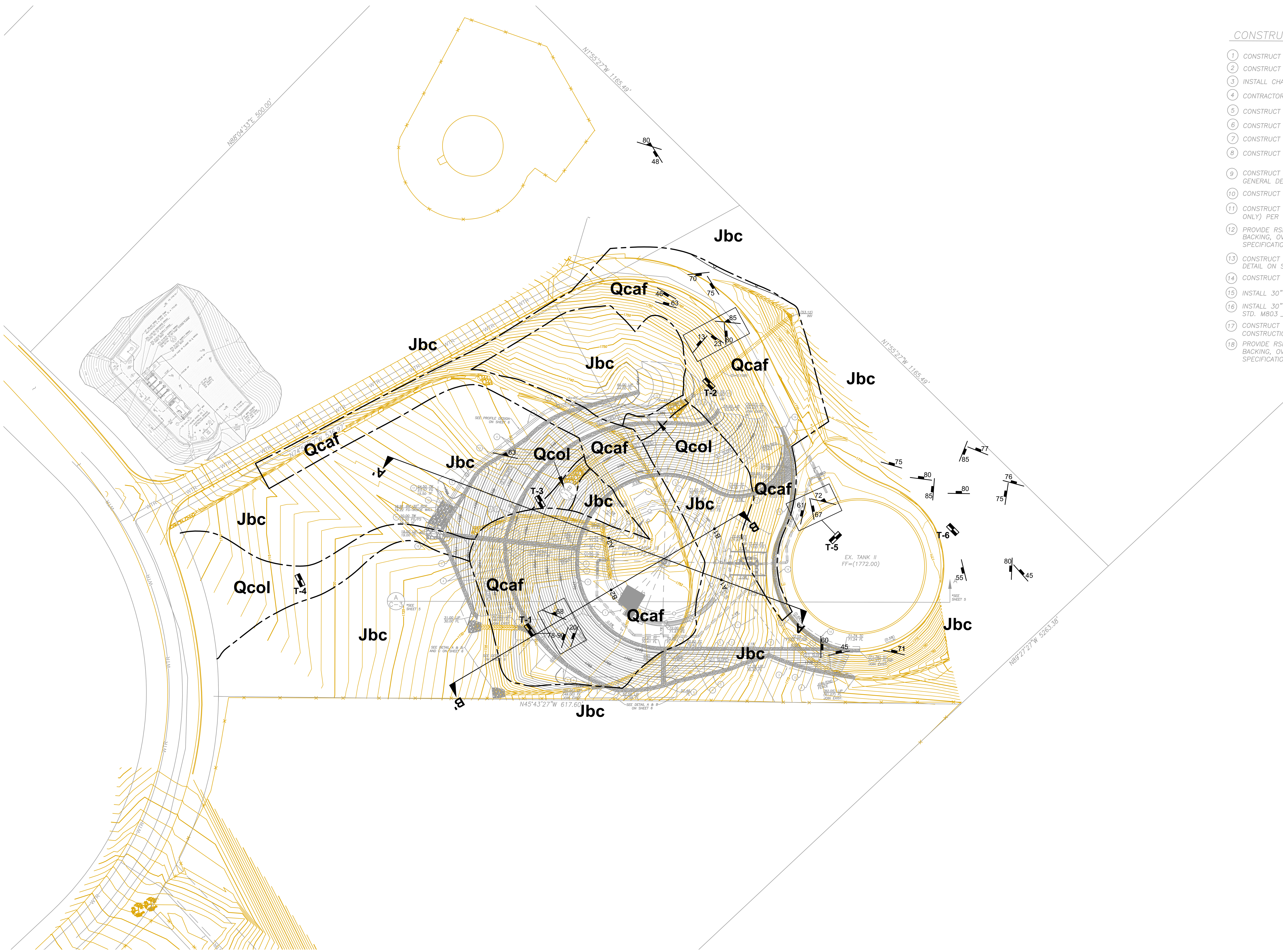
Albus-Keefe & Associates, 2003, Grading Plan Review, Quail Valley Tank, (Canyon Heights Project), County of Riverside, California, dated August 6, 2003 (J.N. 1120.02).

Albus-Keefe & Associates, 2002, Geotechnical Investigation, Proposed Canyon Heights Reservoir Site, Quail Valley Area, County of Riverside, California, dated August 15, 2002 (J.N. 1120.02).

Converse Consultants, 2017, Third party Review Letter, Quail Valley II Tank Site (Alternate 2 Location), Canyon Heights Area, Riverside County, California, dated September 15, 2017 (P.N. 16-81-283-01).

Plans

Quail Valley III Tank Site Improvements, City of Menifee, California, plan prepared by Adkan Engineers, plot dated Feb 4, 2020.



CONSTRUCTION NOTES

1	CONSTRUCT NEW AC PAVEMENT, 4" AC OVER 6" AB PER DETAIL ON SHEET 5	12,838 S.F.
2	CONSTRUCT 6" CURB & GUTTER PER CITY OF MENIFEE STD. 200 "TYPE 6 C&G"	537 L.F.
3	INSTALL CHAIN-LINK FENCE PER EMWD STD. D-672. MATCH EXISTING FENCE HEIGHT	508 L.F.
4	CONTRACTOR TO INSTALL HYDROSEED ON ALL FILL SLOPES. SEE SPECS (TYP.)	29,351 S.F.
5	CONSTRUCT 3'W X 1'D CONCRETE SWALE PER DETAIL ON SHEET 5	918 L.F.
6	CONSTRUCT 3' WIDE SOIL BENCH SLOPED AT 0.5% TOWARDS GUTTER AS SHOWN	393 L.F.
7	CONSTRUCT DOWN-DRAIN PER DETAIL ON SHEET 5	137 L.F.
8	CONSTRUCT 3' WIDE CONCRETE RIBBON GUTTER PER DETAIL ON SHEET 5	163 L.F.
9	CONSTRUCT SPLASH WALL AND CONCRETE DRAINAGE SWALE TRANSITION PER GENERAL DETAIL ON SHEET 5, AND DETAILS "A" & "D" ON SHEET 6	2 EA.
10	CONSTRUCT 3' WIDE CURB OPENING PER DETAIL ON SHEET 5	2 EA.
11	CONSTRUCT 1' WIDE SOIL BENCH AND 1'W FENCE FOOTING (AT POSTS ONLY) PER CITY OF MENIFEE STD. 200 AND SECTION B-B ON SHEET 5	523 L.F.
12	PROVIDE RSP 1/4 TON CLASS RIP-RAP, OF 2.7' THICKNESS OVER 9" NO. 2 BACKING, OVER 1100N MIRAFI FILTER FABRIC; PLACEMENT PER CALTRANS SPECIFICATION 72: FULL-DEPTH GROUT, 3' MIN.	182 S.F.
13	CONSTRUCT TRANSITION TO 8' WIDE CONCRETE RIBBON GUTTER PER DETAIL ON SHEET 6	1 EA.
14	CONSTRUCT 2' WIDE SAW-CUT LINE AND REPLACE WITH FULL-DEPTH ASPHALT	220 S.F.
15	INSTALL 30" C.M.P. (2 3/4" X 1 1/2") BY CONTECH OR ENGINEER APPROVED EQUAL	106 L.F.
16	INSTALL 30" CONCRETE COLLAR PER RIVERSIDE COUNTY FLOOD CONTROL STD. M803	2 EA.
17	CONSTRUCT HEADWALL PER CAL TRANS STD. D90 W/ CABLE RAILING (NEW CONSTRUCTION) ATOP EACH LEG OF HEADWALL PER CAL TRANS STD. PLAN B11-47	1 EA.
18	PROVIDE RSP 1 TON CLASS RIP-RAP, OF 4.4' THICKNESS OVER 9" NO. 2 BACKING, OVER 1100N MIRAFI FILTER FABRIC; PLACEMENT PER CALTRANS SPECIFICATION 72: FULL-DEPTH GROUT, 3' MIN.	155 S.F.

EXPLANATION
(LOCATIONS APPROXIMATE)

- T-6 - Exploratory Trench (JN 1120.02, 8/6/03)
- 80 - Joint Attitude
- 20 - Exfoliation Attitude
- B B' - Cross-Section
- Geologic Contact
- Qcaf - Compacted Artificial Fill
- Qcol - Colluvium
- Jbc - Bedrock: Bedford Canyon Formation

ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

GEOTECHNICAL MAP

Job No.: 2485.02 | Date: 04/28/20 | Plate: 1

40 0 40 80 120
Scale 1" = 40'

P.Z. 1800

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811
OR
1-800-227-2600

EASTERN MUNICIPAL WATER DISTRICT

CIVIL ENGINEER OF SUBDIVISIONS | DATE

APPROVALS

PROJECT ENG.	INITIAL	DATE

DATE	BY	MARK	REVISIONS	APPR.	DATE

PLANS PREPARED BY:
adkan ENGINEERS
Civil Engineering · Surveying · Planning
6879 Airport Drive, Riverside, CA 92504
Tel:(951) 688-0241 · Fax:(951) 688-0599
Under the Supervision of: Michael R. Brendecke, R.C.E. 83363 Exp. 3.31.21 Date:

SEAL-ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NO. 83363
EXP. 3-31-21
CIVIL
STATE OF CALIFORNIA

SCALE: AS NOTED
DESIGNED BY: MRB
DRAWN BY: ASM
CHECKED BY: MRB
APPROVED:
DATE:

CITY OF MENIFEE
ENGINEERING DEPARTMENT

JONATHAN G. SMITH
DIRECTOR OF PUBLIC WORKS/
CITY ENGINEER
RCE 61253
EXP. 6/30/21
DATE

RECOMMENDED BY: DATE

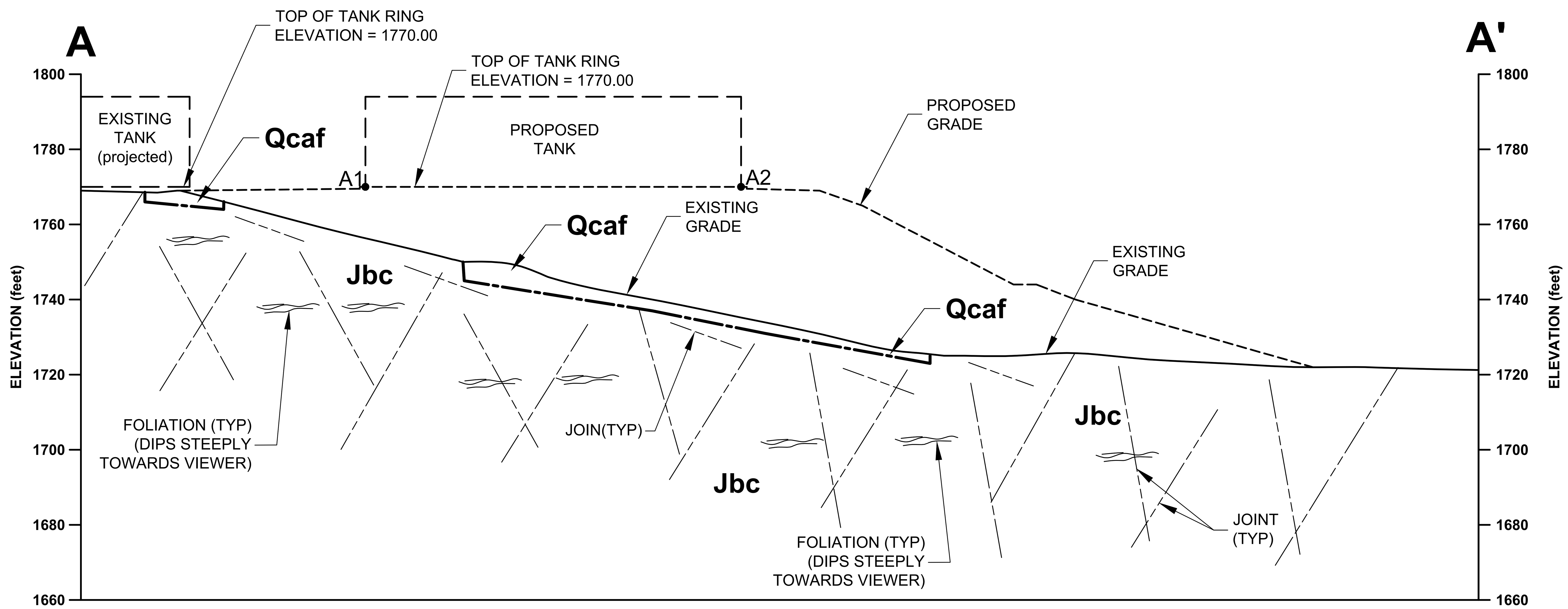
.\ENGINEERING\Black and white Seal.JPG

CITY OF MENIFEE GP19-038

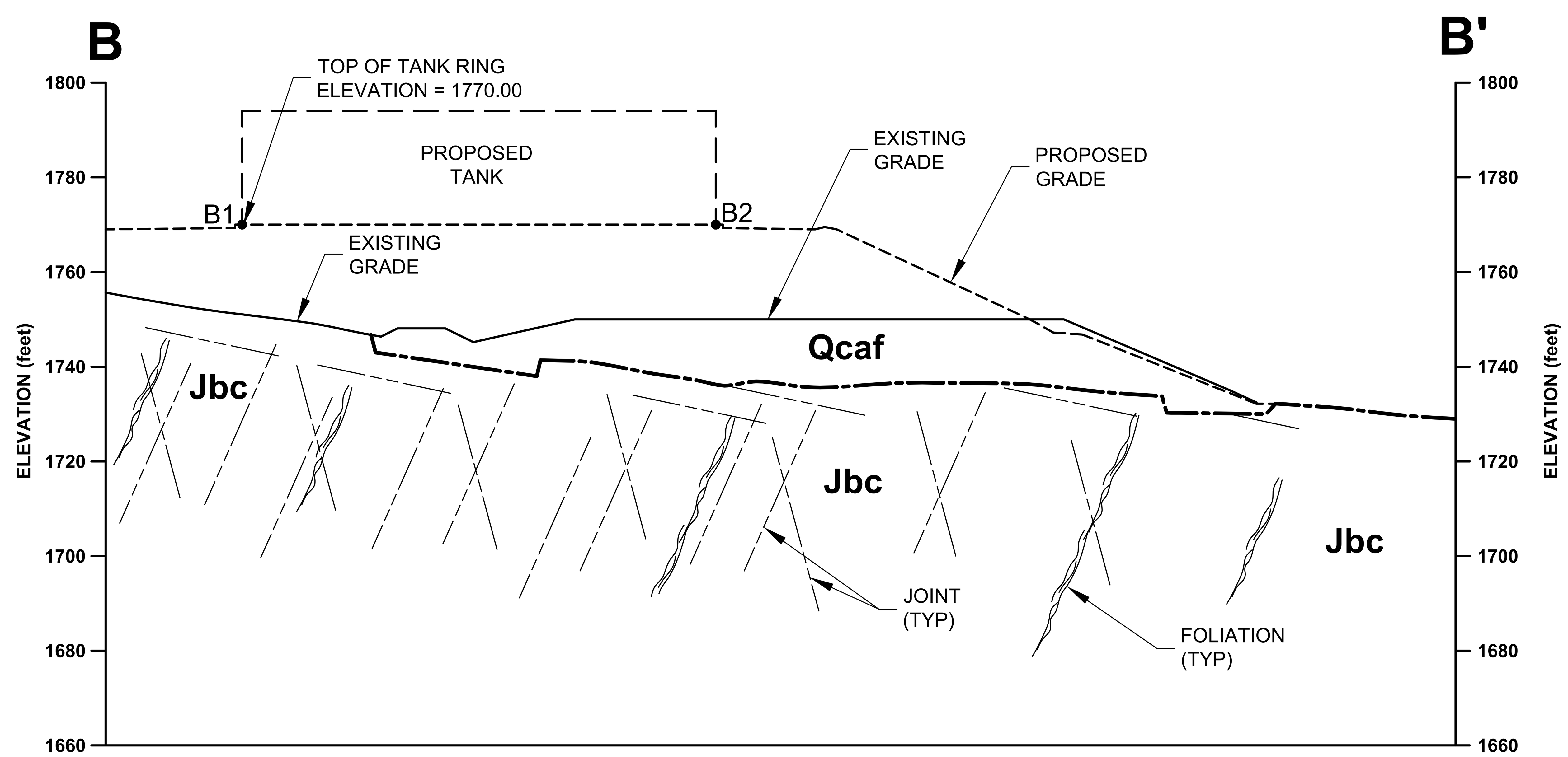
QUAIL VALLEY III TANK
SITE IMPROVEMENTS
SITE GRADING PLAN

I.D.
S.A.
W.O.
C.O.
COORD.
ADKAN SET: SHT. 4 OF 7 modified
EMWD SET: SHT. 8 OF 39
D-

Apr 28, 2020



SCALE: 1" = 20'



SCALE: 1" = 20'

ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

GEOLOGIC CROSS-SECTIONS A & B

Job No.: 2485.02	Date: 04/28/20	Plate: 2

APPENDIX A

EXPLORATION LOGS AND LAB TESTING
BY ALBUS-KEEFE & ASSOCIATES INC., AUGUST 15, 2002

DESCRIPTIVE LOG OF TRENCH EXCAVATION

Trench Number	Depth (Feet)	U.S.C.S. Symbol	Field Description
T-1	0-.5	ML	TOPSOIL (no map symbol): Silty Gravel with cobbles, brown, dry, porous, and rootlets.
	.5-3.0		BEDROCK; Bedford Canyon Formation (Jbc): Quartzite, fine grained, light brown, dry, hard to very hard, very thinly to thickly foliated, closely to medium jointed, moderately weathered with clay films and rusty brown to black oxidation on fracture surfaces. Foliation and Joint: N22W, 68N Joint: N62E, 78-90N Joint: N65E, 20N Total Depth: 3.0 feet No Caving No Ground Water Trench Backfilled Without Compaction

Trench Number	Depth (Feet)	U.S.C.S. Symbol	Field Description
T-2	0-3.0	ML	COLLUVIUM (Qcol): Silty Gravel with cobbles and trace boulders, brown, dry, porous, and rootlets.
	3.0-4.0		BEDROCK; Bedford Canyon Formation (Jbc): Quartzite, fine grained, light brown, dry, hard to very hard, very thinly to thickly foliated, closely to medium jointed, moderately weathered with clay films and rusty brown to black oxidation on fracture surfaces. Foliation and Joint: N40W, 85N Joint: N42E, 80S Joint:N13W, 23W Joint: N85E, 13N Total Depth: 4.0 feet No Caving No Ground Water Trench Backfilled Without Compaction

DESCRIPTIVE LOG OF TRENCH EXCAVATION

Trench Number	Depth (Feet)	U.S.C.S. Symbol	Field Description
T-3	0-4.5	ML	COLLUVIUM (Qcol): Silty Gravel with cobbles and trace boulders, brown, dry, porous, and rootlets.
	4.5-5.0		BEDROCK; Bedford Canyon Formation (Jbc): Quartzite, fine grained, light brown, dry, hard to very hard, very closely to closely jointed, moderately to highly weathered with some carbonate mineralization and clay films and rusty brown to black oxidation on fracture surfaces.
			Total Depth: 5.0 feet No Caving No Ground Water Trench Backfilled Without Compaction

Trench Number	Depth (Feet)	U.S.C.S. Symbol	Field Description
T-4	0-4.0	ML	COLLUVIUM (Qcol): Sandy Silt, brown, dry, soft, very porous, rootlets, some gravel to boulder size angular rock fragments along the base.
	4.0-4.5		BEDROCK; Bedford Canyon Formation (Jbc): Quartzite, fine grained, light brown, dry, hard to very hard, very closely to closely jointed, moderately to highly weathered with clay films and rusty brown to black oxidation on fracture surfaces.
			Total Depth: 4.5 feet No Caving No Ground Water Trench Backfilled Without Compaction

DESCRIPTIVE LOG OF TRENCH EXCAVATION

Trench Number	Depth (Feet)	U.S.C.S. Symbol	Field Description
T-5	0-.5	ML	TOPSOIL (no map symbol): Silty Gravel with cobbles, brown, dry, porous, and rootlets.
	.5-2.5		BEDROCK; Bedford Canyon Formation (Jbc): Quartzite, fine grained, light brown, dry, hard to very hard, very thinly to thickly foliated, closely to medium jointed, moderately weathered with clay films and rusty brown to black oxidation on fracture surfaces. @2.5',refusal Foliation and Joint: N35W, 72N Joint: N32E, 67S Joint: N56E, 61N Total Depth: 2.5 feet No Caving No Ground Water Trench Backfilled Without Compaction

Trench Number	Depth (Feet)	U.S.C.S. Symbol	Field Description
T-6	0-2.0	ML	TOPSOIL (no map symbol): Sandy Silt with some gravel and cobbles, brown, dry, stiff, porous, rootlet.
	2.0-4.0		BEDROCK; Bedford Canyon Formation (Jbc): Quartzite, fine grained, light brown, dry, hard to very hard, very thinly to thickly foliated, closely to medium jointed, moderately weathered with clay films and rusty brown to black oxidation on fracture surfaces. @4.0',refusal Joint: N62E, 77S Total Depth: 4.0 feet No Caving No Ground Water Trench Backfilled Without Compaction

LABORATORY TESTING PROGRAM

Soil Classification

Soils encountered within the exploratory borings were initially classified in the field in general accordance with the visual-manual procedures of the Unified Soil Classification System (ASTM Test Method D2488-93). The samples were re-examined in the laboratory and classifications reviewed and then revised where appropriate. The assigned group symbols are presented in the Boring Logs provided in Appendix A.

Laboratory Maximum Dry Density

Maximum dry density and optimum moisture content was performed on a representative sample of the site materials. AMEC Earth &Environmental of Anaheim, California, performed the test in accordance with Method A of ASTM D 1557-91. Pertinent test values are given on Table B-1.

Particle Size Analyses

A particle size analysis was performed on representative sample of site materials. AMEC Earth & Environmental of Anaheim, California, performed the test in accordance with ASTM D 422-63. The results are presented graphically on the attached Plates B-1.

Expansion Potential

An expansion index test was performed on a representative sample of the site materials. AMEC Earth &Environmental of Anaheim, California, performed the test in accordance with Uniform Building Code Standard 18-2. . The test result is presented on Table B-1.

Corrosion Analyses

Tests were performed on a selected sample to determine soluble sulfate content, chloride content, minimum resistivity, and pH. AMEC Earth &Environmental of Anaheim, California, performed the tests in accordance with Test Method California 417, CTM 422, and CTM 643. Their test results are included on Table B-1.

R-Value

R-value testing was performed by AMEC Earth &Environmental of Anaheim, California, following the guidelines established by CA301 specifications. The test result is included on Table B-1.

TABLE B-1

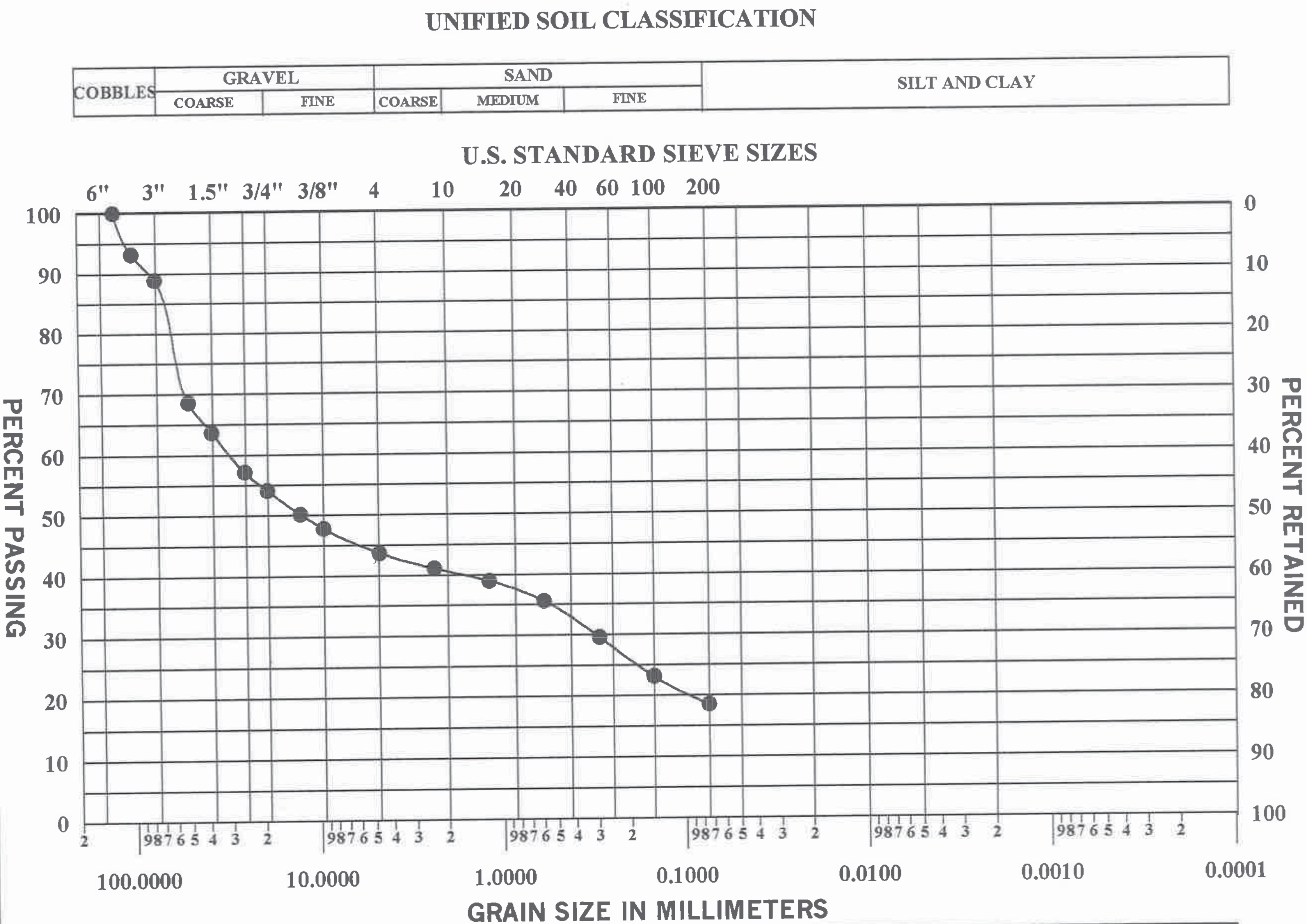
Boring No.	Sample Depth (ft)	Soil Description	Test Results
T-3	0-4.5	Silty Gravel (GM)	Maximum Dry Density: 134.0 pcf Optimum Moisture Content: 7.5 % Expansion Index: 0 R-Value: 75 Soluble Sulfate Content: 0.0255 % Chloride Content: 41 ppm Minimum Resistivity: 3680 ohm-cm pH: 6.8

ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

GRAIN SIZE DISTRIBUTION

Job No: 1120.02

Plate No: B-1



LOCATION	DEPTH	SYMBOL	LL	PI	CLASSIFICATION
T-3	0' to 4.5'	●———●			Silty Well-Graded Gravel (GM)
		■- - - -■			
		▲—— - - ▲			
		◆— - — ◆			

APPENDIX B

LAB TESTING BY ALBUS-KEEFE & ASSOCIATES INC., APRIL 7, 2017

LABORATORY TESTING PROGRAM

Soil Classification

Soils encountered during site visit and sampling were initially classified in the field in general accordance with the visual-manual procedures of the Unified Soil Classification System (ASTM D 2488). The samples were re-examined in the laboratory and classifications reviewed and then revised where appropriate.

Maximum Dry Density and Optimum Moisture Content

Maximum dry density and optimum moisture content of onsite soils were determined for a selected sample in general accordance with Method A of ASTM D 1557. Pertinent test values are given on Table B.

Grain Size/Hydrometer Analysis

Grain size/hydrometer analysis was performed on selected samples to verify visual classifications performed in the field. The tests were performed in accordance with ASTM D 422-63. Test results are graphically presented on Plates B-1 and B-2.

Direct Shear

A direct shear test was performed for soil samples remolded to 95 percent of the maximum dry density. The tests were performed in general accordance with ASTM D 3080. Three specimens were prepared for each test. The test specimens were artificially saturated, and then sheared under varied normal loads at a constant rate of strain. The results are graphically presented on Plates B-3 through B-6.

Consolidation

One consolidation test was performed on a selected soil sample in general conformance with ASTM D 2435. The sample was first compacted to 95% maximum dry density (ASTM D 1557), and was moisture conditioned close to optimum water content per the same test. Axial loads were applied in several increments to a laterally restrained 1-inch-high sample. Loads were applied in geometric progression by doubling the previous load, and the resulting deformations were recorded at selected time intervals. The test sample was inundated at a selected load to evaluate the effect of a sudden increase in moisture content (hydro-consolidation potential). Results of the tests are graphically presented on Plate B-7.

Expansion Potential

Expansion index testing was performed on a selected sample. The test was performed in conformance with ASTM D 4829. The test result is presented in Table B.

Soluble Sulfate Content

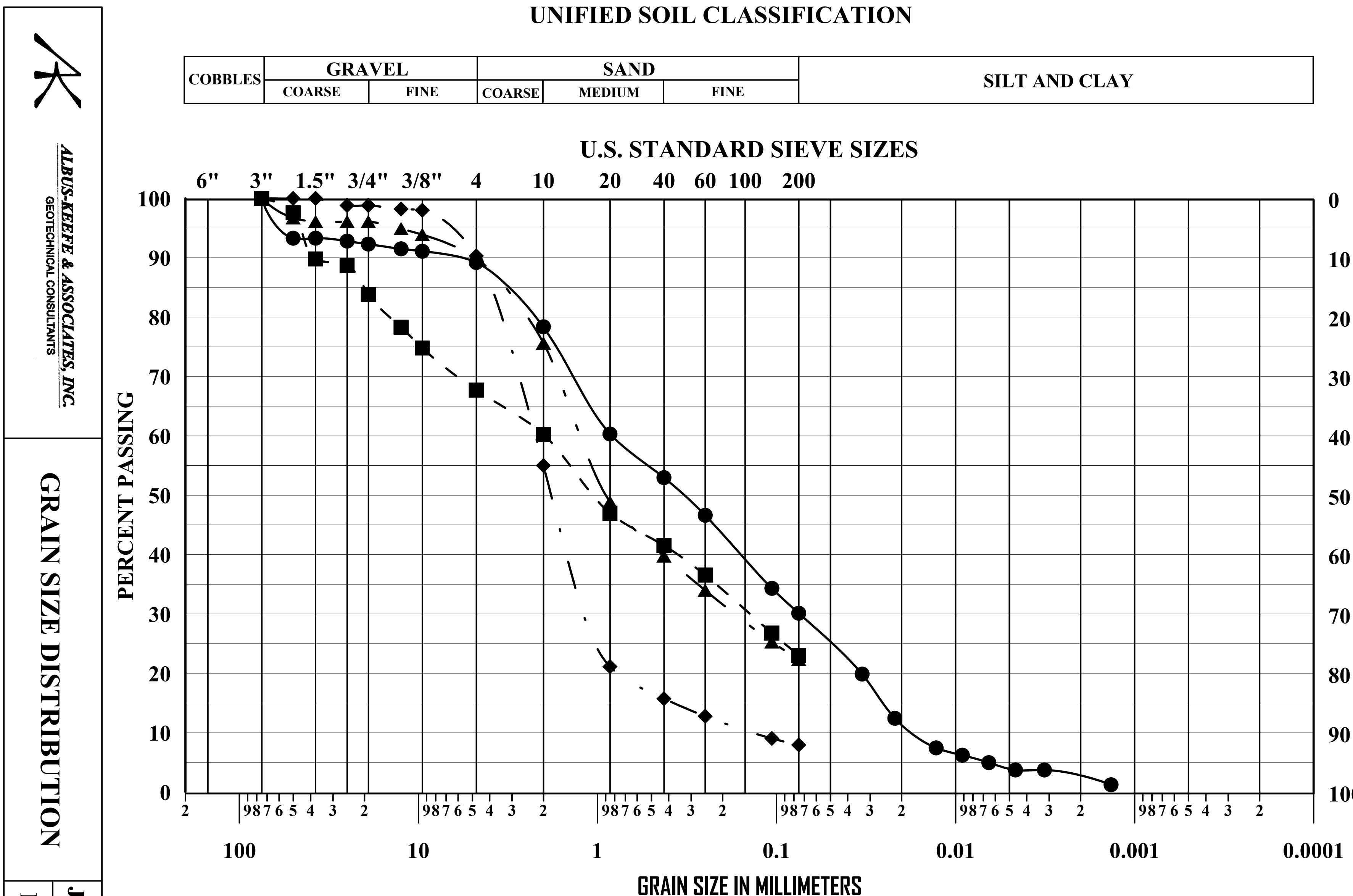
A chemical analysis was performed on a selected soil sample to determine soluble sulfate content. The test was performed in accordance with California Test Method (CTM) 417. The test result is included in Table B.

Corrosion Analysis

Corrosion analyses, which included minimum resistivity and pH, were performed on a selected sample. The tests were performed in accordance with California Test Method CTM 643. The test results are included in Table B.

TABLE B
SUMMARY OF LABORATORY TEST RESULTS

Sample Label	Sample Depth (ft)	Soil Description	Test Results	
S-3	0-4	Silty Sand (SM)	Maximum Dry Density: Optimum Moisture Content: Expansion Index: Expansion Potential: Soluble Sulfate Content: Sulfate Exposure: pH: Minimum Resistivity (ohm-cm): Chloride Content:	129.0 pcf 9.5% 17 Very Low 0.000% Negligible 6.59 1,300 0.00023%
S-5	0-2	Silty Sand (SM)	Maximum Dry Density: Optimum Moisture Content:	131.5 pcf 9.5%
S-7	0-2	Silty Sand (SM)	Maximum Dry Density: Optimum Moisture Content:	142.0 pcf 9.0%
S-8	0-2	Silty Sand (SM)	Maximum Dry Density: Optimum Moisture Content:	134.0 pcf 8.0%

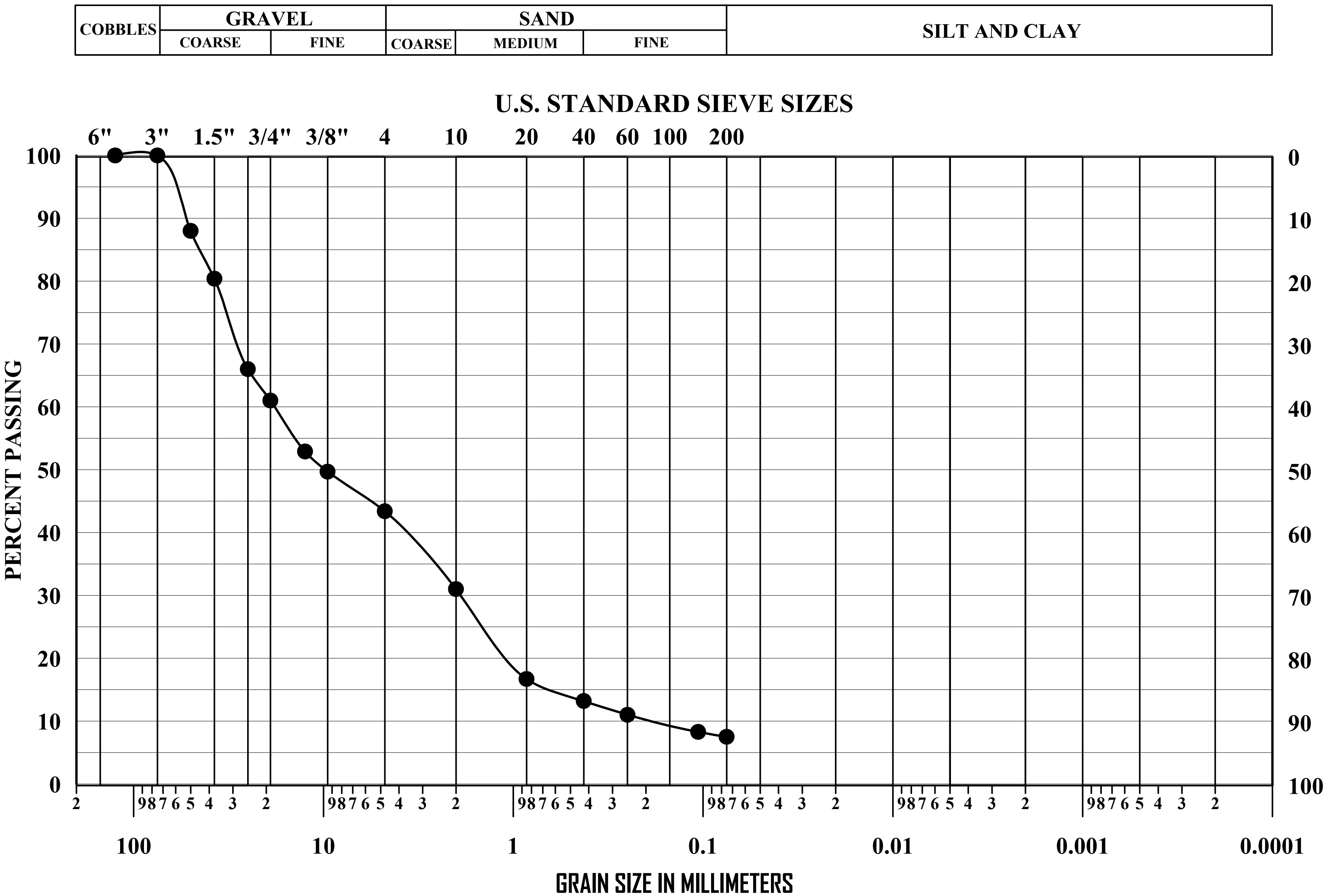


LOCATION	SAMPLE	SYMBOL	LL	PI	CLASSIFICATION
S-3	0-4 feet	●——●			Silty Sand (SM)
S-5	0-2 feet	■- - - -■			Silty Sand (SM)
S-7	0-2 feet	▲— - - ▲			Silty Sand (SM)
S-8	0-2 feet	◆— · — ◆			Sand with Silt (SP-SM)

Job No: 2485.01

Plate No: B-1

UNIFIED SOIL CLASSIFICATION



LOCATION	SAMPLE	SYMBOL	LL	PI	CLASSIFICATION
S-9	0-2 feet	●———●			Gravel with Silt and Sand (GP-GM)

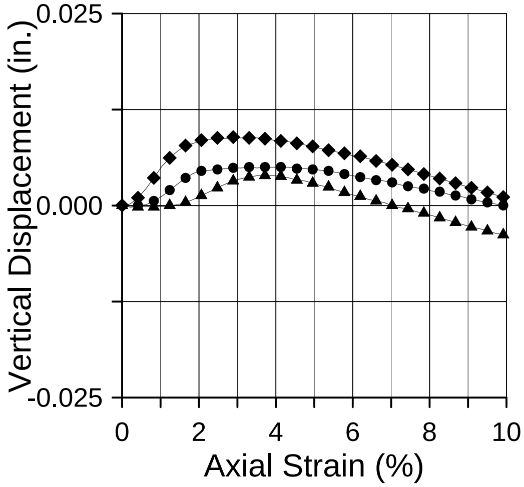
ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

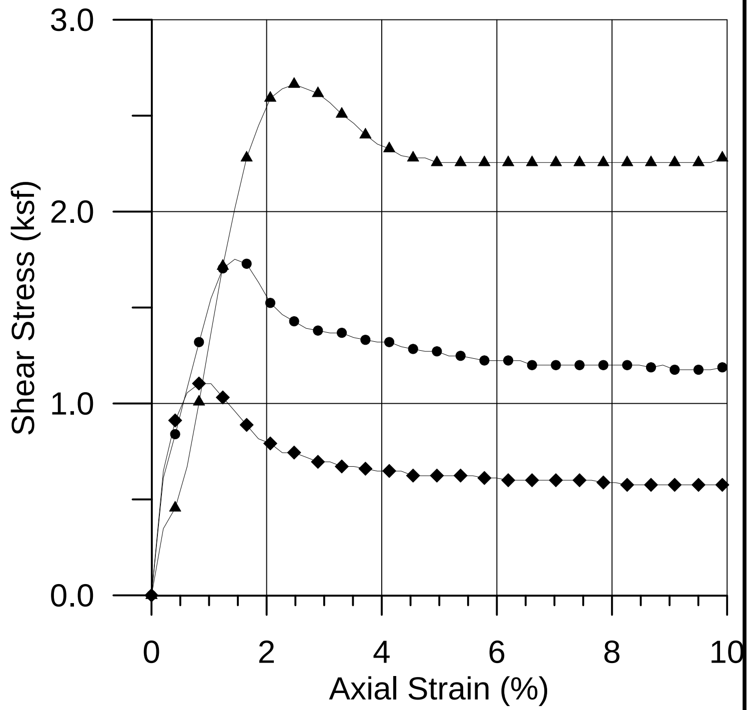
GRAIN SIZE DISTRIBUTION

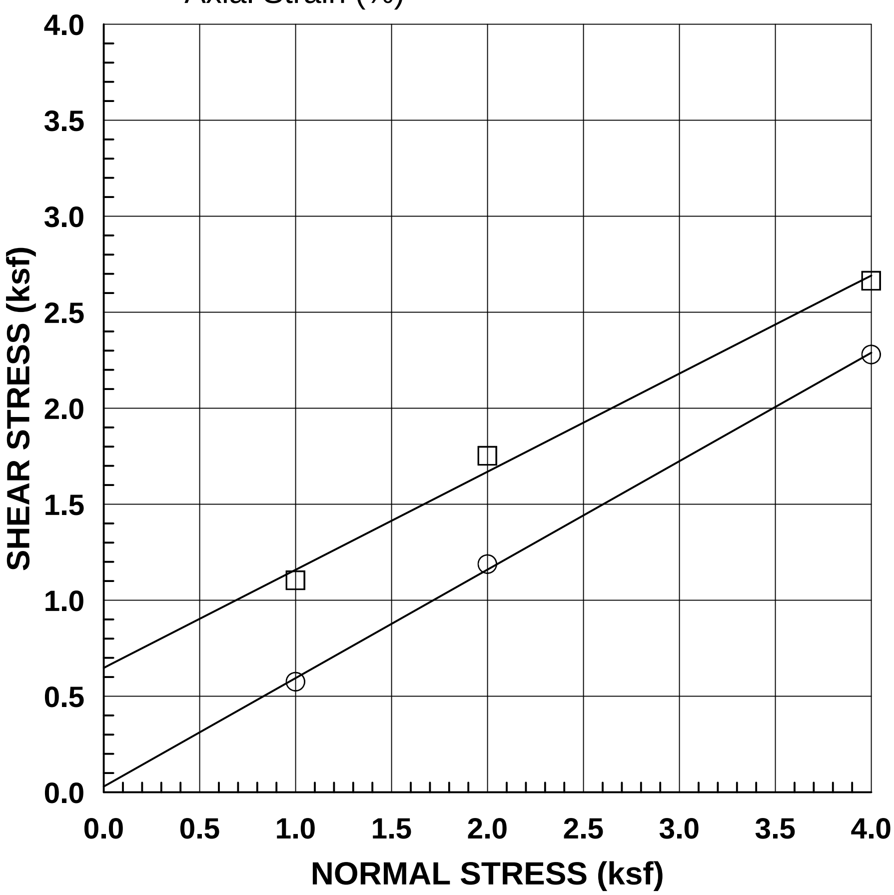
Job No: 2485.01

Plate No: B-2

Specimen No.	1	2	3
Normal Stress (ksf)	1	2	4
Peak Shear Stress (ksf)	1.104	1.752	2.664
Peak Displacement (in)	0.009	0.005	0.004
Ultimate Shear Stress (ksf)	0.576	1.188	2.28
Ultimate Displacement (in)	0.25	0.25	0.25
Initial Dry Density (pcf)	122.6	122.6	122.6
Initial Moisture Content (%)	9.5	9.5	9.5
Strain Rate (in/min)	0.01		







Strain Legend

◆	1
●	2
▲	4

Strength Legend

□	Peak
○	Ultimate

SAMPLE LOCATION	SAMPLE TYPE	SAMPLE DESCRIPTION
S-3 @ 0-4 feet	@ 95% of 129 pcf @ 9.5%	Silty Sand (SM)

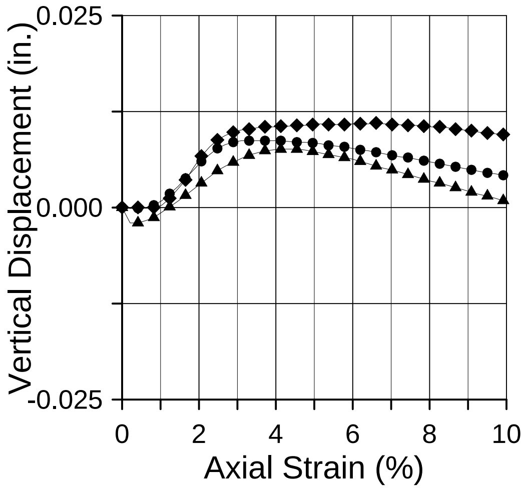
ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

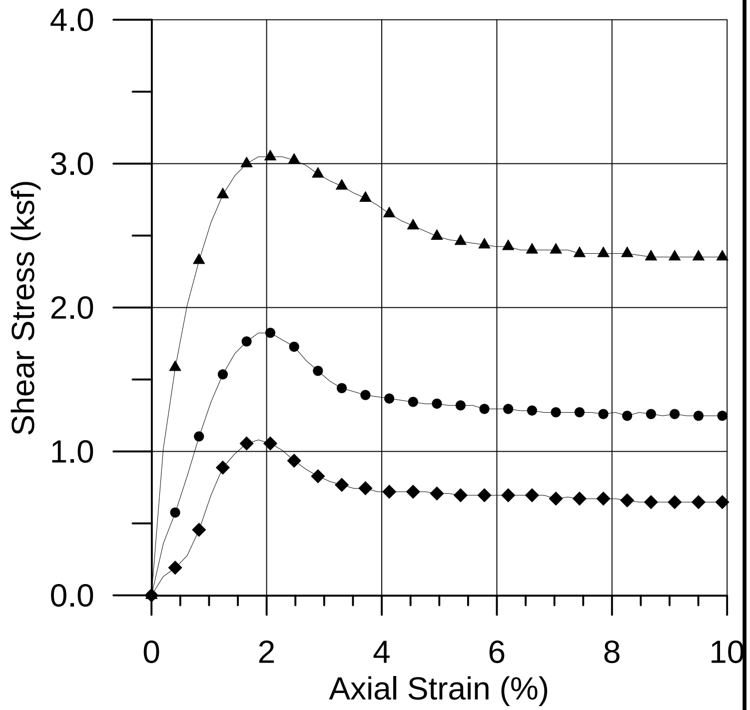
DIRECT SHEAR

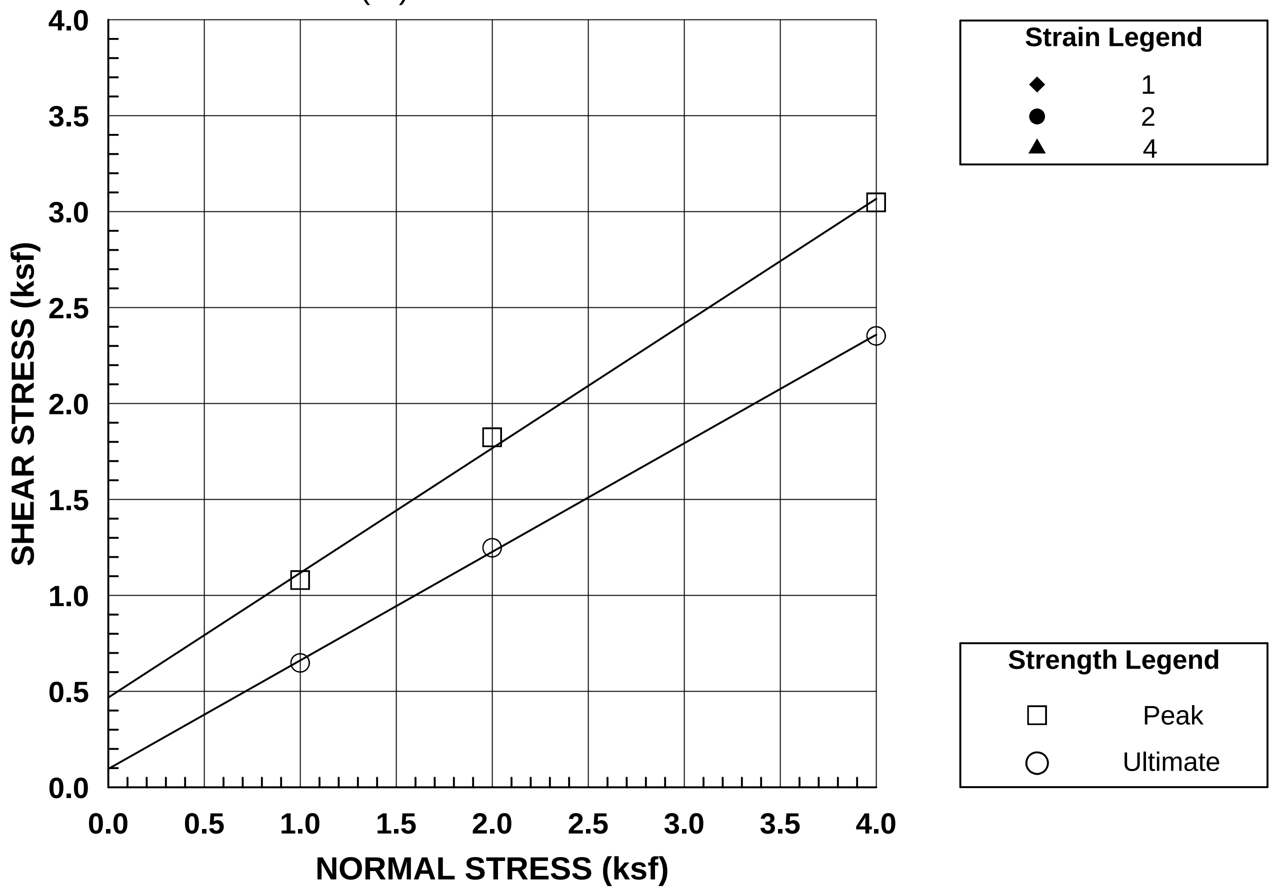
Job No: 2485.01

Plate No: B-3

Specimen No.	1	2	3
Normal Stress (ksf)	1	2	4
Peak Shear Stress (ksf)	1.08	1.824	3.048
Peak Displacement (in)	0.011	0.009	0.008
Ultimate Shear Stress (ksf)	0.648	1.248	2.352
Ultimate Displacement (in)	0.25	0.25	0.25
Initial Dry Density (pcf)	124.9	124.9	124.9
Initial Moisture Content (%)	9.5	9.5	9.5
Strain Rate (in/min)	0.01		







SAMPLE LOCATION	SAMPLE TYPE	SAMPLE DESCRIPTION
S-5 @ 0-2 feet	@ 95% of 131.5 pcf @ 9.5%	Silty Sand (SM)

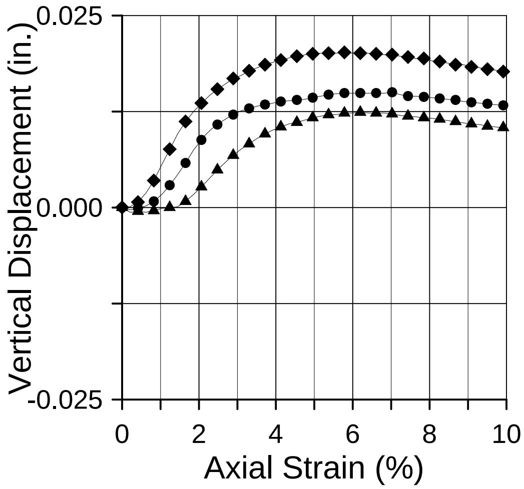
ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

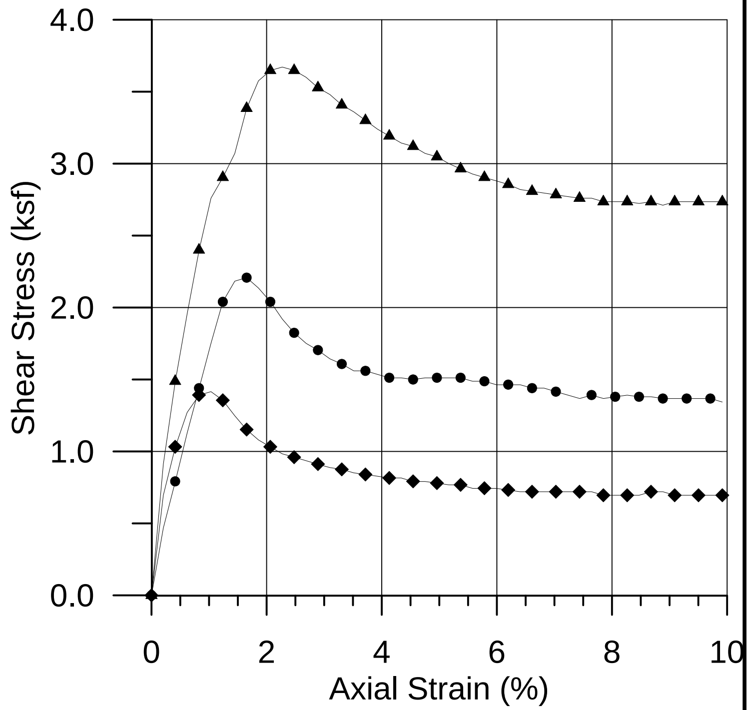
DIRECT SHEAR

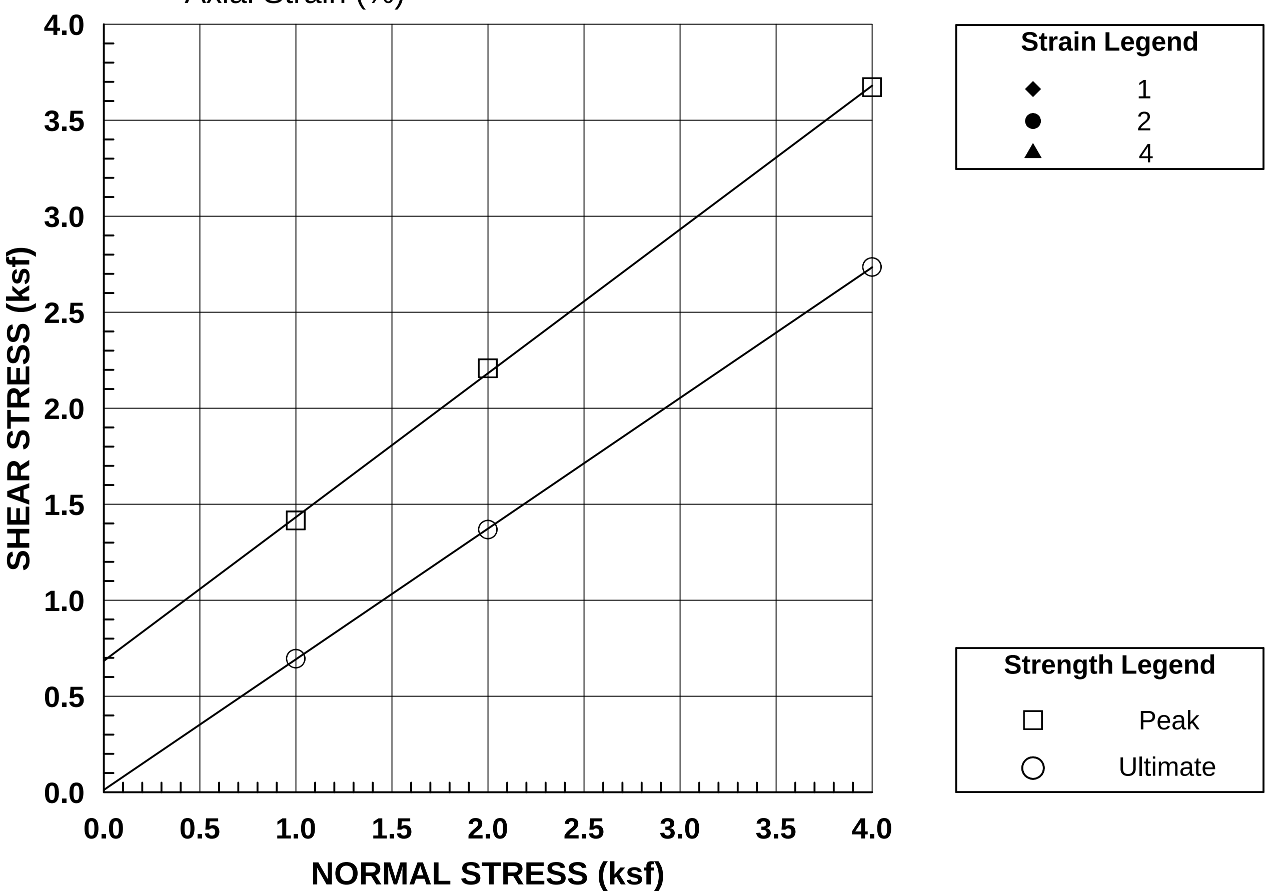
Job No: 2485.01

Plate No: B-4

Specimen No.	1	2	3
Normal Stress (ksf)	1	2	4
Peak Shear Stress (ksf)	1.416	2.208	3.672
Peak Displacement (in)	0.02	0.015	0.012
Ultimate Shear Stress (ksf)	0.696	1.368	2.736
Ultimate Displacement (in)	0.25	0.25	0.25
Initial Dry Density (pcf)	135.3	135.3	135.3
Initial Moisture Content (%)	9	9	9
Strain Rate (in/min)	0.01		







SAMPLE LOCATION	SAMPLE TYPE	SAMPLE DESCRIPTION
S-7 @ 0-2 feet	@ 95% of 142.5 pcf @ 9%	Silty Sand with Clay (SM)

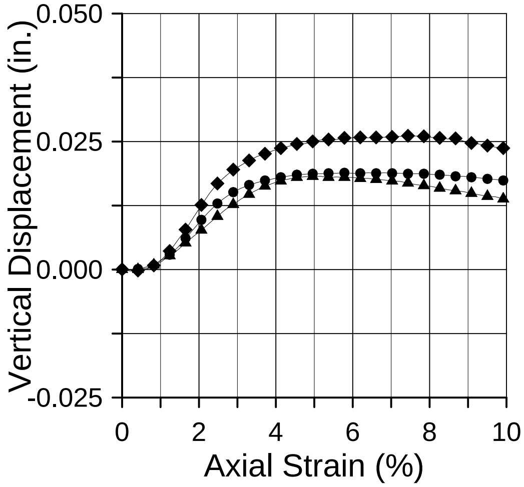
ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

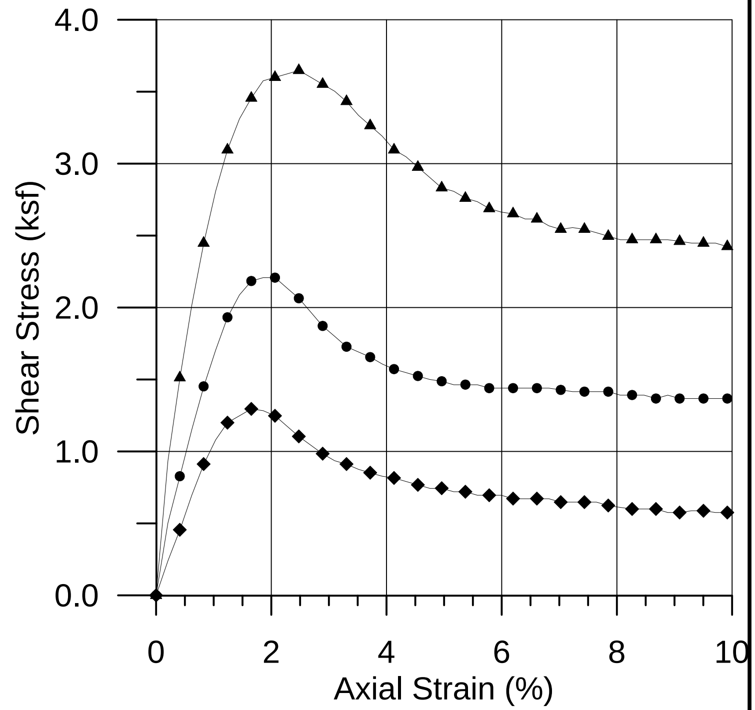
DIRECT SHEAR

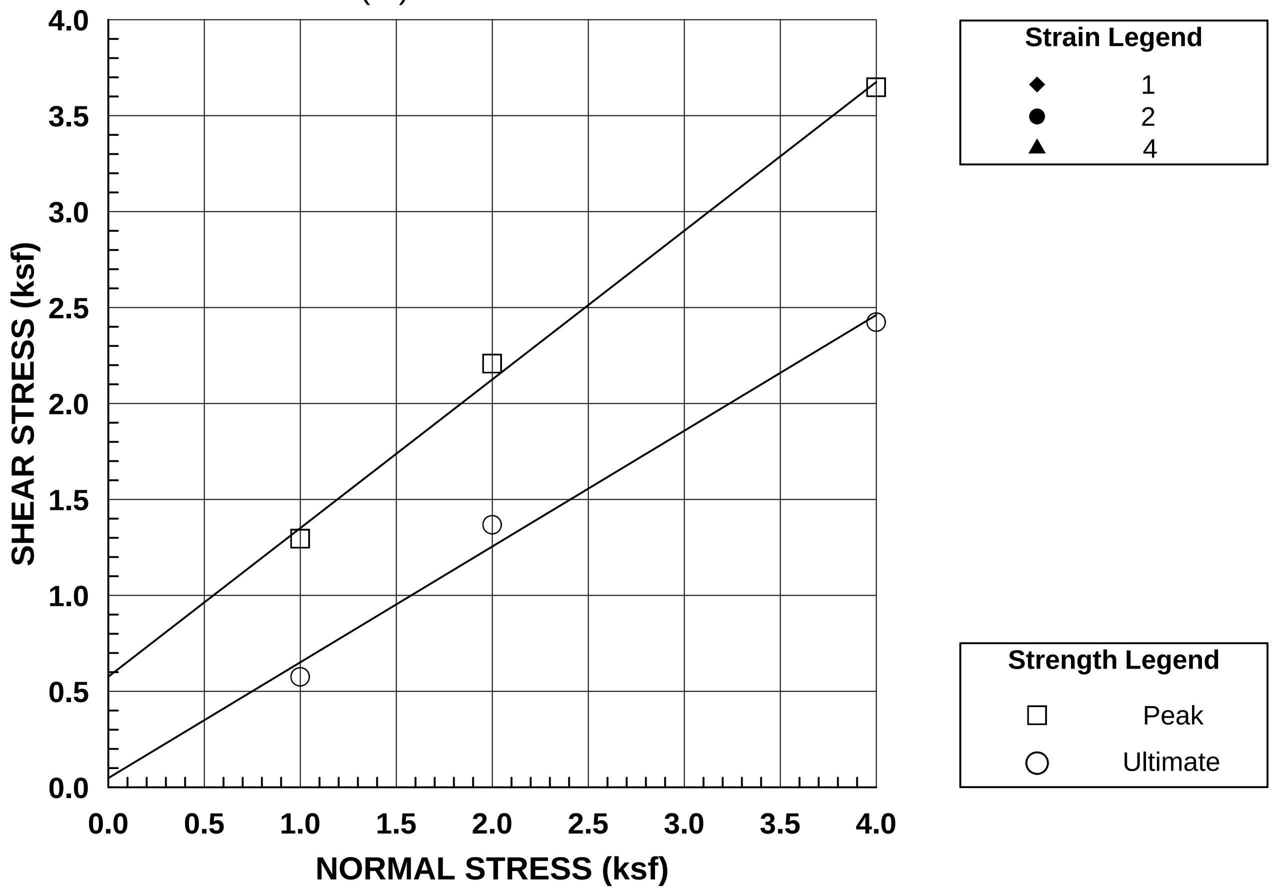
Job No: 2485.01

Plate No: B-5

Specimen No.	1	2	3
Normal Stress (ksf)	1	2	4
Peak Shear Stress (ksf)	1.296	2.208	3.648
Peak Displacement (in)	0.026	0.019	0.018
Ultimate Shear Stress (ksf)	0.576	1.368	2.424
Ultimate Displacement (in)	0.25	0.25	0.25
Initial Dry Density (pcf)	127.2	127.2	127.2
Initial Moisture Content (%)	8	8	8
Strain Rate (in/min)	0.01		







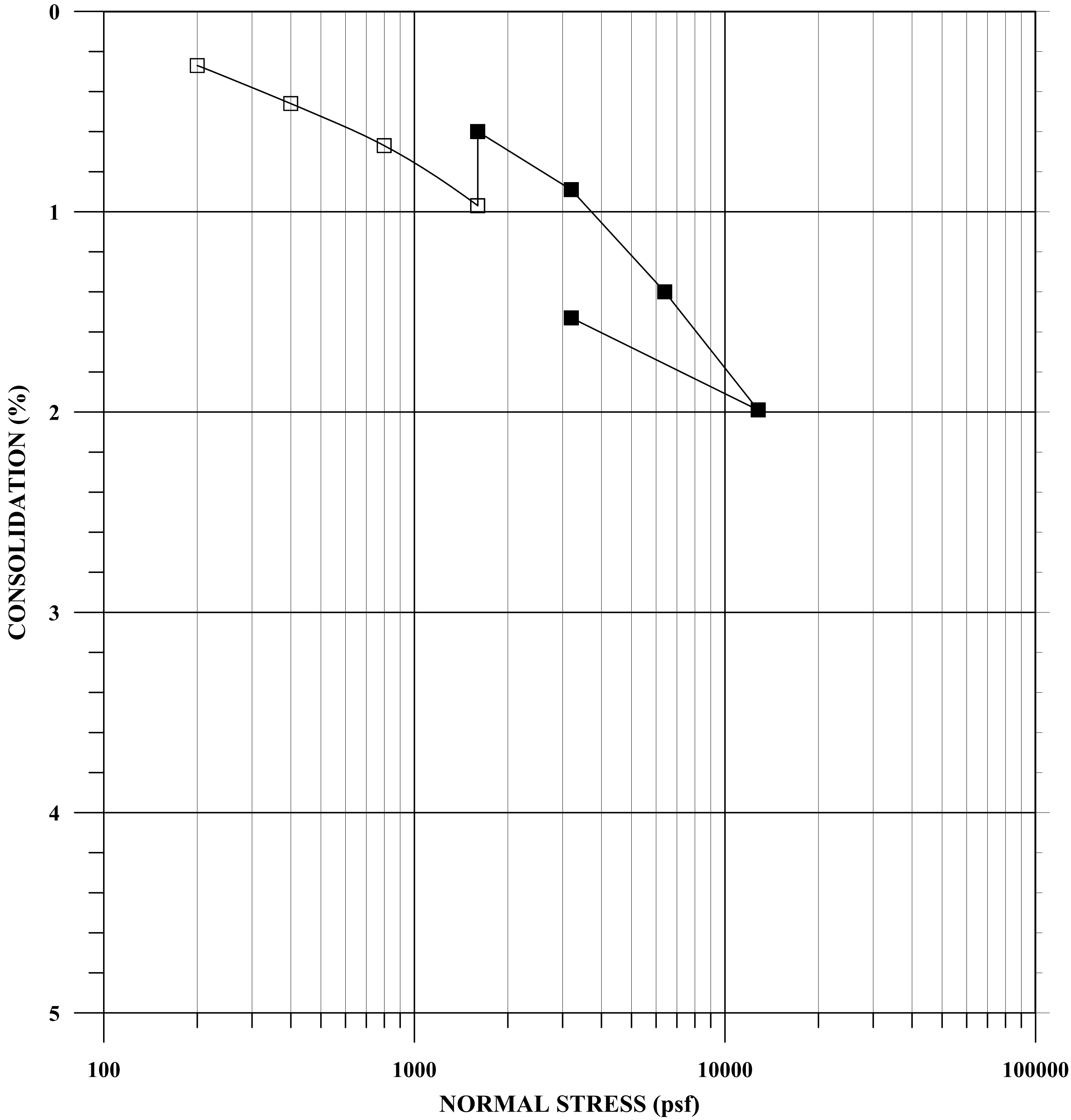
SAMPLE LOCATION	SAMPLE TYPE	SAMPLE DESCRIPTION
S-8 @ 0-2 feet	@ 95% of 134 pcf @ 8%	Silty Sand (SM)

ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

DIRECT SHEAR

Job No: 2485.01

Plate No: B-6



Sample Location:	S-3	Initial Dry Density (pcf):	123.6	Legend
Sample Depth:	0-4 ft	Initial Moisture Content (%):	8.6	Field Moisture
Classification:	Qof	Final Moisture Content (%):	13.3	Saturated

ALBUS-KEEFE & ASSOCIATES, INC. GEOTECHNICAL CONSULTANTS	CONSOLIDATION TEST RESULTS	Job No: 2485.00
		Plate No: B-7

APPENDIX C

SETTLEMENT CALCULATIONS

Center Column Base Plate

J.N. 2485.02

SPT (ML)	0	E (KSF)=	0
SPT (SP)	0	E (KSF)=	0
SPT (SW)	0	E (KSF)=	0
SPT (GP/GW)	0	E (KSF)=	0
Qc (TONS/FT^2)	0	E (KSF)=	0
Rel. den. (%)	40	E (KSF)=	136

Rectangular Load (Boussinesq)

Soil Density (psf)	135	
Sat. Density (psf)	135	
Depth to Water (ft)	500	
Footing Depth (ft)	0	
Footing width (ft)	10.00	(Assumed)
Footing length (ft)	10.00	(Assumed)
Bearing pressure (psf)	1100	
Layer Thickness (ft)	1	
Starting Depth (ft)	0	
Rigidity Factor	0.5	Typ square ftg=0.5, strip footing=0.7

Depth (ft)	Sigma o (psf)	Delta Sigma (psf)	Sigma f (psf)	E (ksf)	Sett. (in)	Cumul. Sett. (in)
0.5	68	1052	1119	450	0.02	0.02
1.5	203	955	1157	450	0.02	0.04
2.5	338	861	1199	450	0.01	0.05
3.5	473	773	1245	450	0.01	0.06
4.5	608	691	1298	450	0.01	0.07
5.5	743	616	1359	450	0.01	0.08
6.5	878	549	1427	450	0.01	0.09
7.5	1013	489	1502	450	0.01	0.09
8.5	1148	436	1584	450	0.01	0.10
9.5	1283	390	1672	450	0.01	0.11
10.5	1418	349	1767	450	0.00	0.11
11.5	1553	314	1866	450	0.00	0.11
12.5	1688	282	1970	450	0.00	0.12
13.5	1823	255	2077	450	0.00	0.12
14.5	1958	231	2188	450	0.00	0.12
15.5	2093	210	2302	450	0.00	0.13
16.5	2228	191	2419	450	0.00	0.13
17.5	2363	175	2537	450	0.00	0.13
18.5	2498	160	2658	450	0.00	0.13
19.5	2633	147	2780	450	0.00	0.14
20.5	2768	136	2903	450	0.00	0.14
21.5	2903	126	3028	450	0.00	0.14
22.5	3038	116	3154	450	0.00	0.14
23.5	3173	108	3281	450	0.00	0.14

Center of the Tank

Soil Density (psf)	135	
Sat. Density (psf)	135	
Depth to Water (ft)	500	
Footing Depth (ft)	0	
Footing Diameter (ft)	104.0	Tank Diameter + (2 x 1/2) Width of Ring Footing
Footing Radius (ft)	52.0	
Bearing pressure (psf)	1900	Updated pad pressure; per email of 2/5/2020 from Matthew Mills
Layer Thickness (ft)	1	
Starting Depth (ft)	0	
Rigidity Factor	1	Typ square ftg=0.5, strip footing=0.7

Depth (ft)	Sigma o (psf)	Delta Sigma (psf)	Sigma f (psf)	E (ksf)	Z Below Footing (ft)	Iz	Sett. (in)	Cumul. Sett. (in)
0.5	68	1900	1967	450	0.50	1.0000	0.05	0.05
1.5	203	1900	2102	450	1.50	1.0000	0.05	0.10
2.5	338	1900	2237	450	2.50	0.9999	0.05	0.15
3.5	473	1899	2372	450	3.50	0.9997	0.05	0.20
4.5	608	1899	2506	450	4.50	0.9994	0.05	0.25
5.5	743	1898	2640	450	5.50	0.9988	0.05	0.30
6.5	878	1896	2774	450	6.50	0.9981	0.05	0.35
7.5	1013	1894	2907	450	7.50	0.9971	0.05	0.40
8.5	1148	1892	3040	450	8.50	0.9958	0.05	0.46
9.5	1283	1889	3171	450	9.50	0.9942	0.05	0.51
10.5	1418	1885	3303	450	10.50	0.9922	0.05	0.56
11.5	1553	1881	3433	450	11.50	0.9899	0.05	0.61
12.5	1688	1876	3563	450	12.50	0.9872	0.05	0.66
13.5	1823	1870	3692	450	13.50	0.9841	0.05	0.71
14.5	1958	1863	3821	450	14.50	0.9806	0.05	0.76
15.5	2093	1856	3948	450	15.50	0.9767	0.05	0.81
16.5	2228	1847	4075	450	16.50	0.9723	0.05	0.85
17.5	2363	1838	4201	450	17.50	0.9676	0.05	0.90
18.5	2498	1828	4326	450	18.50	0.9623	0.05	0.95
19.5	2633	1818	4450	450	19.50	0.9567	0.05	1.00
20.5	2768	1806	4574	450	20.50	0.9507	0.05	1.05
21.5	2903	1794	4697	450	21.50	0.9442	0.05	1.10
22.5	3038	1781	4819	450	22.50	0.9374	0.05	1.14
23.5	3173	1767	4940	450	23.50	0.9302	0.05	1.19
24.5	3308	1753	5060	230	24.50	0.9226	0.09	1.28
25.5	3443	1738	5180	230	25.50	0.9146	0.09	1.37
26.5	3578	1722	5300	230	26.50	0.9064	0.09	1.46
27.5	3713	1706	5418	230	27.50	0.8978	0.09	1.55
28.5	3848	1689	5537	230	28.50	0.8890	0.09	1.64
29.5	3983	1672	5654	230	29.50	0.8799	0.09	1.73
30.5	4118	1654	5771	1000	30.50	0.8705	0.02	1.75
40.5	5468	1459	6927	1200	40.50	0.7680	0.01	1.92
50.5	6818	1258	8075	1400	50.50	0.6619	0.01	2.04
60.5	8168	1071	9239	1600	60.50	0.5638	0.01	2.13
70.5	9518	910	10427	1800	70.50	0.4788	0.01	2.20
80.5	10868	774	11641	2000	80.50	0.4073	0.00	2.25
90.5	12218	661	12879	2200	90.50	0.3481	0.00	2.29
100.5	13568	569	14136	2400	100.50	0.2994	0.00	2.33
110.5	14918	493	15410	2500	110.50	0.2592	0.00	2.35
120.5	16268	429	16697	2500	120.50	0.2260	0.00	2.37
130.5	17618	377	17994	2500	130.50	0.1983	0.00	2.39
140.5	18968	333	19300	2500	140.50	0.1752	0.00	2.41
150.5	20318	296	20613	2500	150.50	0.1556	0.00	2.42
160.5	21668	264	21932	2500	160.50	0.1391	0.00	2.44
170.5	23018	237	23255	2500	170.50	0.1249	0.00	2.45
180.5	24368	214	24582	2500	180.50	0.1127	0.00	2.46
190.5	25718	194	25912	2500	190.50	0.1022	0.00	2.47
191.5	25853	192	26045	2500	191.50	0.1012	0.00	2.47
192.5	25988	190	26178	2500	192.50	0.1003	0.00	2.47
193.5	26123	189	26311	2500	193.50	0.0993	0.00	2.47
194.5	26258	187	26444	2500	194.50	0.0984	0.00	2.47

Edge Point A1

J.N. 2485.02

SPT (ML)	0	E (KSF)=	0
SPT (SP)	0	E (KSF)=	0
SPT (SW)	0	E (KSF)=	0
SPT (GP/GW)	0	E (KSF)=	0
Qc (TONS/FT^2)	0	E (KSF)=	0
Rel. den. (%)	40	E (KSF)=	136

Edge Point A-1

Soil Density (psf)	135	
Sat. Density (psf)	135	
Depth to Water (ft)	500	
Footing Depth (ft)	0	
Footing Diameter (ft)	104.0	Tank Diameter + (2 x 1/2) Width of Ring Footing
Footing Radius (ft)	52.0	
Bearing pressure (psf)	1900	Updated pad pressure; per email of 2/5/2020 from Matthew Mills
Layer Thickness (ft)	1	
Starting Depth (ft)	0	
Rigidity Factor	1	Typ square ftg=0.5, strip footing=0.7

Depth (ft)	Sigma o (psf)	Delta Sigma (psf)	Sigma f (psf)	E (ksf)	z/a	Iz	Sett. (in)	Cumul. Sett. (in)
0.5	68	947	1015	450	0.0096	0.4985	0.03	0.03
1.5	203	941	1144	450	0.0288	0.4954	0.03	0.05
2.5	338	935	1273	450	0.0481	0.4923	0.02	0.08
3.5	473	930	1402	450	0.0673	0.4892	0.02	0.10
4.5	608	924	1531	450	0.0865	0.4862	0.02	0.12
5.5	743	918	1660	450	0.1058	0.4831	0.02	0.15
6.5	878	912	1790	450	0.1250	0.4800	0.02	0.17
7.5	1013	906	1919	450	0.1442	0.4769	0.02	0.20
8.5	1148	900	2048	450	0.1635	0.4738	0.02	0.22
9.5	1283	894	2177	450	0.1827	0.4708	0.02	0.25
10.5	1418	889	2306	450	0.2019	0.4677	0.02	0.27
11.5	1553	882	2435	450	0.2212	0.4644	0.02	0.29
12.5	1688	876	2564	450	0.2404	0.4611	0.02	0.32
13.5	1823	870	2692	450	0.2596	0.4579	0.02	0.34
14.5	1958	864	2821	1000	0.2788	0.4546	0.01	0.35
20.5	2768	826	3594	1120	0.3942	0.4350	0.01	0.41
30.5	4118	764	4882	1320	0.5865	0.4023	0.01	0.48
40.5	5468	702	6170	1520	0.7788	0.3696	0.01	0.55
50.5	6818	642	7459	1720	0.9712	0.3378	0.00	0.59
60.5	8168	581	8749	1920	1.1635	0.3060	0.00	0.63
70.5	9518	527	10044	2120	1.3558	0.2772	0.00	0.67
80.5	10868	475	11343	2320	1.5481	0.2502	0.00	0.69
90.5	12218	432	12649	2500	1.7404	0.2272	0.00	0.72
100.5	13568	388	13955	2500	1.9327	0.2041	0.00	0.74
110.5	14918	354	15271	2500	2.1250	0.1863	0.00	0.75
120.5	16268	325	16593	2500	2.3173	0.1713	0.00	0.77
130.5	17618	297	17914	2500	2.5096	0.1563	0.00	0.78
140.5	18968	268	19236	2500	2.7019	0.1413	0.00	0.80
150.5	20318	240	20557	2500	2.8942	0.1263	0.00	0.81
160.5	21668	217	21885	2500	3.0865	0.1143	0.00	0.82
170.5	23018	201	23219	2500	3.2788	0.1060	0.00	0.83
178.5	24098	189	24286	2500	3.4327	0.0994	0.00	0.84

Edge Point A2

J.N. 2485.02

SPT (ML)	0	E (KSF)=	0
SPT (SP)	0	E (KSF)=	0
SPT (SW)	0	E (KSF)=	0
SPT (GP/GW)	0	E (KSF)=	0
Qc (TONS/FT^2)	0	E (KSF)=	0
Rel. den. (%)	40	E (KSF)=	136

Edge Point A-2

Soil Density (psf)	135	
Sat. Density (psf)	135	
Depth to Water (ft)	500	
Footing Depth (ft)	0	
Footing Diameter (ft)	104.0	Tank Diameter + (2 x 1/2) Width of Ring Footing
Footing Radius (ft)	52.0	
Bearing pressure (psf)	1900	Updated pad pressure; per email of 2/5/2020 from Matthew Mills
Layer Thickness (ft)	1	
Starting Depth (ft)	0	
Rigidity Factor	1	Typ square ftg=0.5, strip footing=0.7

Depth (ft)	Sigma o (psf)	Delta Sigma (psf)	Sigma f (psf)	E (ksf)	z/a	Iz	Sett. (in)	Cumul. Sett. (in)
0.5	68	947	1015	450	0.0096	0.4985	0.03	0.03
1.5	203	941	1144	450	0.0288	0.4954	0.03	0.05
2.5	338	935	1273	450	0.0481	0.4923	0.02	0.08
3.5	473	930	1402	450	0.0673	0.4892	0.02	0.10
4.5	608	924	1531	450	0.0865	0.4862	0.02	0.12
5.5	743	918	1660	450	0.1058	0.4831	0.02	0.15
6.5	878	912	1790	450	0.1250	0.4800	0.02	0.17
7.5	1013	906	1919	450	0.1442	0.4769	0.02	0.20
8.5	1148	900	2048	450	0.1635	0.4738	0.02	0.22
9.5	1283	894	2177	450	0.1827	0.4708	0.02	0.25
10.5	1418	889	2306	450	0.2019	0.4677	0.02	0.27
11.5	1553	882	2435	450	0.2212	0.4644	0.02	0.29
12.5	1688	876	2564	450	0.2404	0.4611	0.02	0.32
13.5	1823	870	2692	450	0.2596	0.4579	0.02	0.34
14.5	1958	864	2821	450	0.2788	0.4546	0.02	0.36
15.5	2093	858	2950	450	0.2981	0.4513	0.02	0.39
16.5	2228	851	3079	450	0.3173	0.4481	0.02	0.41
17.5	2363	845	3208	450	0.3365	0.4448	0.02	0.43
18.5	2498	839	3336	450	0.3558	0.4415	0.02	0.45
19.5	2633	833	3465	450	0.3750	0.4383	0.02	0.48
20.5	2768	826	3594	450	0.3942	0.4350	0.02	0.50
21.5	2903	820	3723	450	0.4135	0.4317	0.02	0.52
22.5	3038	814	3852	450	0.4327	0.4284	0.02	0.54
23.5	3173	808	3980	450	0.4519	0.4252	0.02	0.56
24.5	3308	802	4109	450	0.4712	0.4219	0.02	0.58
25.5	3443	795	4238	450	0.4904	0.4186	0.02	0.60
26.5	3578	789	4367	450	0.5096	0.4154	0.02	0.63
27.5	3713	783	4495	450	0.5288	0.4121	0.02	0.65
28.5	3848	777	4624	450	0.5481	0.4088	0.02	0.67
29.5	3983	771	4753	450	0.5673	0.4056	0.02	0.69
30.5	4118	764	4882	450	0.5865	0.4023	0.02	0.71
31.5	4253	758	5011	450	0.6058	0.3990	0.02	0.73
32.5	4388	752	5139	450	0.6250	0.3958	0.02	0.75
33.5	4523	746	5268	450	0.6442	0.3925	0.02	0.77
34.5	4658	740	5397	230	0.6635	0.3892	0.04	0.81
35.5	4793	733	5526	230	0.6827	0.3859	0.04	0.85
36.5	4928	727	5655	230	0.7019	0.3827	0.04	0.88
37.5	5063	721	5783	230	0.7212	0.3794	0.04	0.92
38.5	5198	715	5912	1000	0.7404	0.3761	0.01	0.93
39.5	5333	708	6041	1020	0.7596	0.3729	0.01	0.94
40.5	5468	702	6170	1040	0.7788	0.3696	0.01	0.95
50.5	6818	642	7459	1240	0.9712	0.3378	0.01	1.02
60.5	8168	581	8749	1440	1.1635	0.3060	0.00	1.07
70.5	9518	527	10044	1640	1.3558	0.2772	0.00	1.11
80.5	10868	475	11343	1840	1.5481	0.2502	0.00	1.15
90.5	12218	432	12649	2040	1.7404	0.2272	0.00	1.17
100.5	13568	388	13955	2240	1.9327	0.2041	0.00	1.20
110.5	14918	354	15271	2440	2.1250	0.1863	0.00	1.22
120.5	16268	325	16593	2500	2.3173	0.1713	0.00	1.23
130.5	17618	297	17914	2500	2.5096	0.1563	0.00	1.25
140.5	18968	268	19236	2500	2.7019	0.1413	0.00	1.26
150.5	20318	240	20557	2500	2.8942	0.1263	0.00	1.27
160.5	21668	217	21885	2500	3.0865	0.1143	0.00	1.28
170.5	23018	201	23219	2500	3.2788	0.1060	0.00	1.29
178.5	24098	189	24286	2500	3.4327	0.0994	0.00	1.30

Edge Point B1

J.N. 2485.02

SPT (ML)	0	E (KSF)=	0
SPT (SP)	0	E (KSF)=	0
SPT (SW)	0	E (KSF)=	0
SPT (GP/GW)	0	E (KSF)=	0
Qc (TONS/FT^2)	0	E (KSF)=	0
Rel. den. (%)	40	E (KSF)=	136

Edge Point B-1

Soil Density (psf)	135	
Sat. Density (psf)	135	
Depth to Water (ft)	500	
Footing Depth (ft)	0	
Footing Diameter (ft)	104.0	Tank Diameter + (2 x 1/2) Width of Ring Footing
Footing Radius (ft)	52.0	
Bearing pressure (psf)	1900	Updated pad pressure; per email of 2/5/2020 from Matthew Mills
Layer Thickness (ft)	1	
Starting Depth (ft)	0	
Rigidity Factor	1	Typ square ftg=0.5, strip footing=0.7

Depth (ft)	Sigma o (psf)	Delta Sigma (psf)	Sigma f (psf)	E (ksf)	z/a	Iz	Sett. (in)	Cumul. Sett. (in)
0.5	68	947	1015	450	0.0096	0.4985	0.03	0.03
1.5	203	941	1144	450	0.0288	0.4954	0.03	0.05
2.5	338	935	1273	450	0.0481	0.4923	0.02	0.08
3.5	473	930	1402	450	0.0673	0.4892	0.02	0.10
4.5	608	924	1531	450	0.0865	0.4862	0.02	0.12
5.5	743	918	1660	450	0.1058	0.4831	0.02	0.15
6.5	878	912	1790	450	0.1250	0.4800	0.02	0.17
7.5	1013	906	1919	450	0.1442	0.4769	0.02	0.20
8.5	1148	900	2048	450	0.1635	0.4738	0.02	0.22
9.5	1283	894	2177	450	0.1827	0.4708	0.02	0.25
10.5	1418	889	2306	450	0.2019	0.4677	0.02	0.27
11.5	1553	882	2435	450	0.2212	0.4644	0.02	0.29
12.5	1688	876	2564	450	0.2404	0.4611	0.02	0.32
13.5	1823	870	2692	450	0.2596	0.4579	0.02	0.34
14.5	1958	864	2821	450	0.2788	0.4546	0.02	0.36
15.5	2093	858	2950	450	0.2981	0.4513	0.02	0.39
16.5	2228	851	3079	450	0.3173	0.4481	0.02	0.41
17.5	2363	845	3208	450	0.3365	0.4448	0.02	0.43
18.5	2498	839	3336	450	0.3558	0.4415	0.02	0.45
19.5	2633	833	3465	1000	0.3750	0.4383	0.01	0.46
20.5	2768	826	3594	1020	0.3942	0.4350	0.01	0.47
30.5	4118	764	4882	1220	0.5865	0.4023	0.01	0.56
40.5	5468	702	6170	1420	0.7788	0.3696	0.01	0.62
50.5	6818	642	7459	1620	0.9712	0.3378	0.00	0.68
60.5	8168	581	8749	1820	1.1635	0.3060	0.00	0.72
70.5	9518	527	10044	2020	1.3558	0.2772	0.00	0.75
80.5	10868	475	11343	2220	1.5481	0.2502	0.00	0.78
90.5	12218	432	12649	2420	1.7404	0.2272	0.00	0.80
100.5	13568	388	13955	2500	1.9327	0.2041	0.00	0.82
110.5	14918	354	15271	2500	2.1250	0.1863	0.00	0.84
120.5	16268	325	16593	2500	2.3173	0.1713	0.00	0.86
130.5	17618	297	17914	2500	2.5096	0.1563	0.00	0.87
140.5	18968	268	19236	2500	2.7019	0.1413	0.00	0.89
150.5	20318	240	20557	2500	2.8942	0.1263	0.00	0.90
160.5	21668	217	21885	2500	3.0865	0.1143	0.00	0.91
170.5	23018	201	23219	2500	3.2788	0.1060	0.00	0.92
178.5	24098	189	24286	2500	3.4327	0.0994	0.00	0.93

Edge Point B2

J.N. 2485.02

SPT (ML)	0	E (KSF)=	0
SPT (SP)	0	E (KSF)=	0
SPT (SW)	0	E (KSF)=	0
SPT (GP/GW)	0	E (KSF)=	0
Qc (TONS/FT^2)	0	E (KSF)=	0
Rel. den. (%)	40	E (KSF)=	136

Edge Point B-2

Soil Density (psf)	135	
Sat. Density (psf)	135	
Depth to Water (ft)	500	
Footing Depth (ft)	0	
Footing Diameter (ft)	104.0	Tank Diameter + (2 x 1/2) Width of Ring Footing
Footing Radius (ft)	52.0	
Bearing pressure (psf)	1900	Updated pad pressure; per email of 2/5/2020 from Matthew Mills
Layer Thickness (ft)	1	
Starting Depth (ft)	0	
Rigidity Factor	1	Typ square ftg=0.5, strip footing=0.7

Depth (ft)	Sigma o (psf)	Delta Sigma (psf)	Sigma f (psf)	E (ksf)	z/a	I	Sett. (in)	Cumul. Sett. (in)
0.5	68	947	1015	450	0.0096	0.4985	0.03	0.03
1.5	203	941	1144	450	0.0288	0.4954	0.03	0.05
2.5	338	935	1273	450	0.0481	0.4923	0.02	0.08
3.5	473	930	1402	450	0.0673	0.4892	0.02	0.10
4.5	608	924	1531	450	0.0865	0.4862	0.02	0.12
5.5	743	918	1660	450	0.1058	0.4831	0.02	0.15
6.5	878	912	1790	450	0.1250	0.4800	0.02	0.17
7.5	1013	906	1919	450	0.1442	0.4769	0.02	0.20
8.5	1148	900	2048	450	0.1635	0.4738	0.02	0.22
9.5	1283	894	2177	450	0.1827	0.4708	0.02	0.25
10.5	1418	889	2306	450	0.2019	0.4677	0.02	0.27
11.5	1553	882	2435	450	0.2212	0.4644	0.02	0.29
12.5	1688	876	2564	450	0.2404	0.4611	0.02	0.32
13.5	1823	870	2692	450	0.2596	0.4579	0.02	0.34
14.5	1958	864	2821	450	0.2788	0.4546	0.02	0.36
15.5	2093	858	2950	450	0.2981	0.4513	0.02	0.39
16.5	2228	851	3079	450	0.3173	0.4481	0.02	0.41
17.5	2363	845	3208	450	0.3365	0.4448	0.02	0.43
18.5	2498	839	3336	450	0.3558	0.4415	0.02	0.45
19.5	2633	833	3465	230	0.3750	0.4383	0.04	0.50
20.5	2768	826	3594	230	0.3942	0.4350	0.04	0.54
21.5	2903	820	3723	230	0.4135	0.4317	0.04	0.58
22.5	3038	814	3852	230	0.4327	0.4284	0.04	0.62
23.5	3173	808	3980	230	0.4519	0.4252	0.04	0.67
24.5	3308	802	4109	230	0.4712	0.4219	0.04	0.71
25.5	3443	795	4238	230	0.4904	0.4186	0.04	0.75
26.5	3578	789	4367	230	0.5096	0.4154	0.04	0.79
27.5	3713	783	4495	230	0.5288	0.4121	0.04	0.83
28.5	3848	777	4624	230	0.5481	0.4088	0.04	0.87
29.5	3983	771	4753	230	0.5673	0.4056	0.04	0.91
30.5	4118	764	4882	230	0.5865	0.4023	0.04	0.95
31.5	4253	758	5011	230	0.6058	0.3990	0.04	0.99
32.5	4388	752	5139	230	0.6250	0.3958	0.04	1.03
33.5	4523	746	5268	230	0.6442	0.3925	0.04	1.07
34.5	4658	740	5397	230	0.6635	0.3892	0.04	1.11
35.5	4793	733	5526	1000	0.6827	0.3859	0.01	1.12
36.5	4928	727	5655	1020	0.7019	0.3827	0.01	1.13
37.5	5063	721	5783	1040	0.7212	0.3794	0.01	1.13
38.5	5198	715	5912	1060	0.7404	0.3761	0.01	1.14
39.5	5333	708	6041	1080	0.7596	0.3729	0.01	1.15
40.5	5468	702	6170	1100	0.7788	0.3696	0.01	1.16
50.5	6818	642	7459	1300	0.9712	0.3378	0.01	1.22
60.5	8168	581	8749	1500	1.1635	0.3060	0.00	1.28
70.5	9518	527	10044	1700	1.3558	0.2772	0.00	1.32
80.5	10868	475	11343	1900	1.5481	0.2502	0.00	1.35
90.5	12218	432	12649	2100	1.7404	0.2272	0.00	1.38
100.5	13568	388	13955	2300	1.9327	0.2041	0.00	1.40
110.5	14918	354	15271	2500	2.1250	0.1863	0.00	1.42
120.5	16268	325	16593	2500	2.3173	0.1713	0.00	1.43
130.5	17618	297	17914	2500	2.5096	0.1563	0.00	1.45
140.5	18968	268	19236	2500	2.7019	0.1413	0.00	1.46
150.5	20318	240	20557	2500	2.8942	0.1263	0.00	1.48
160.5	21668	217	21885	2500	3.0865	0.1143	0.00	1.49
170.5	23018	201	23219	2500	3.2788	0.1060	0.00	1.50
178.5	24098	189	24286	2500	3.4327	0.0994	0.00	1.50

Secondary Settlement (under NEW fill self-weight)

wopt	9.5	(%) Optimum mosture content
wn	11.5	(%) Natural mosture content
Cα	0.00115	Coefficent of secondary compression
		(Figure 16; Page 7.1-237 of NAVFAC; for wn=11.5%)
tsec	50	(years) Useful life
	18250	(days)
tp	0.5	(years) Time to completion of primary settlement
		(or strat of loading of filling of the tank)
	183	(days)

Point	NEW Fill Thickness (ft)	Secondary Settlment: (in)
Center	24	0.66
A1	14	0.39
A2	34	0.94
B1	19	0.52
B2	19	0.52

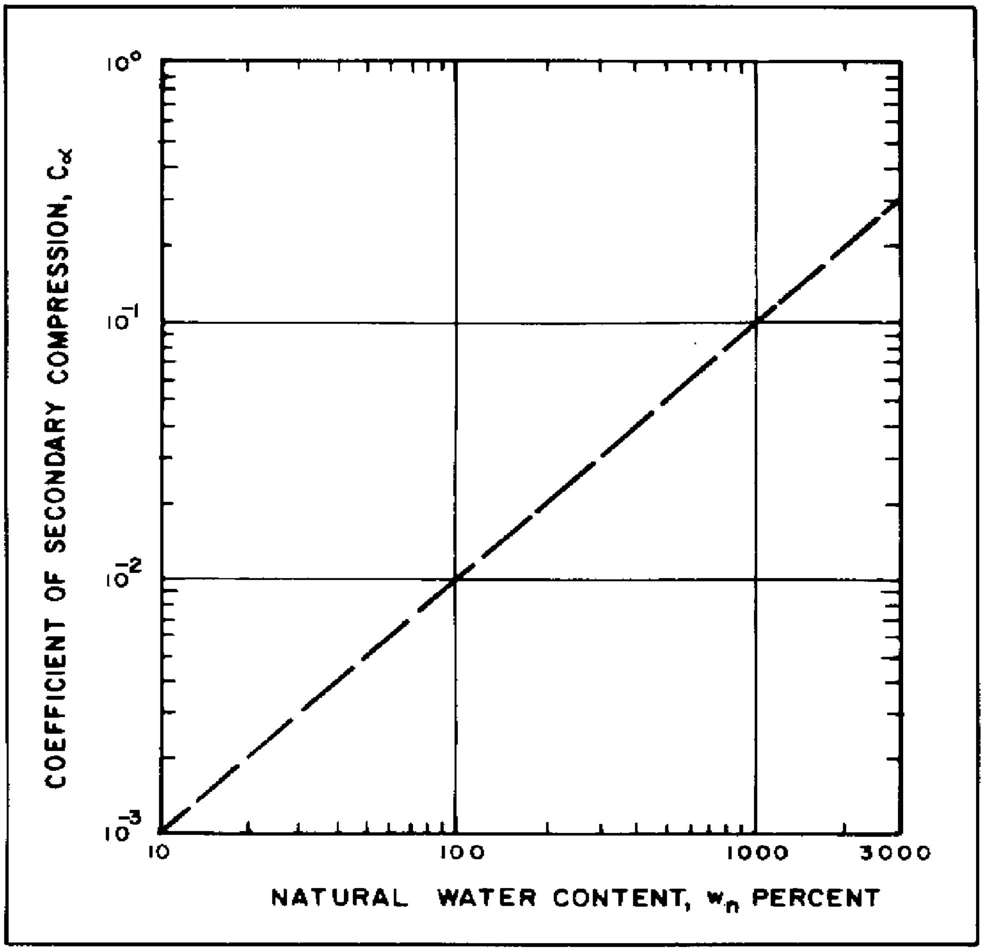
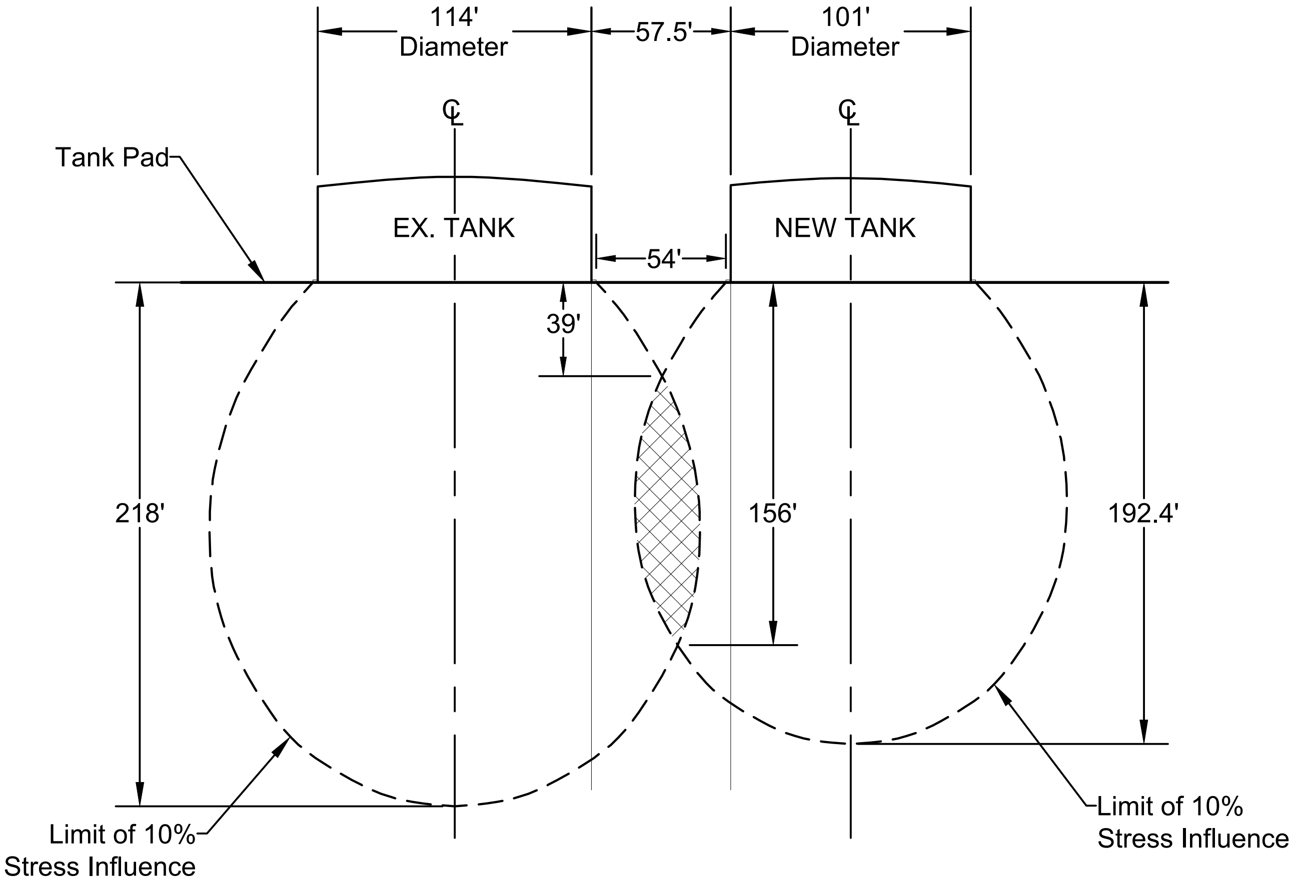


FIGURE 16
Coefficient of Secondary Compression as Related to Natural Water Content

Source: NAVFAC Design Manual 7.01 (1986)



ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

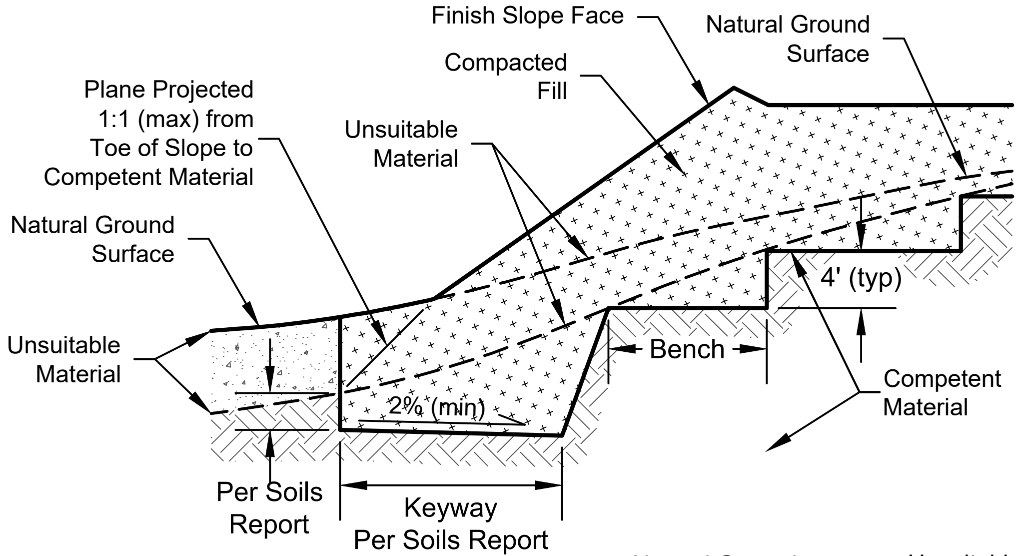
STRESS DIAGRAM

Job No.: 2485.01	Date: 04/28/20	Plate: C - 8

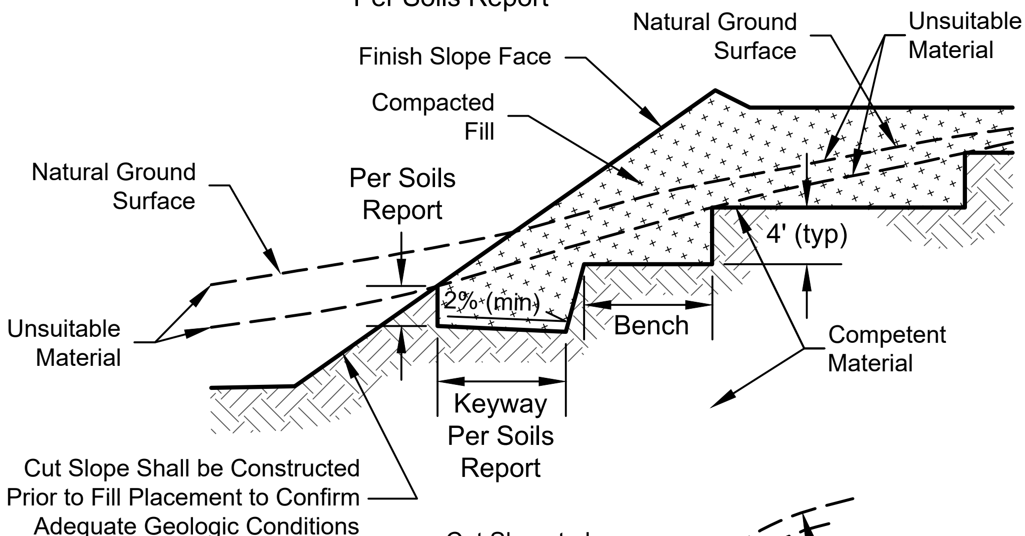
APPENDIX D

STANDARD GRADING DETAILs

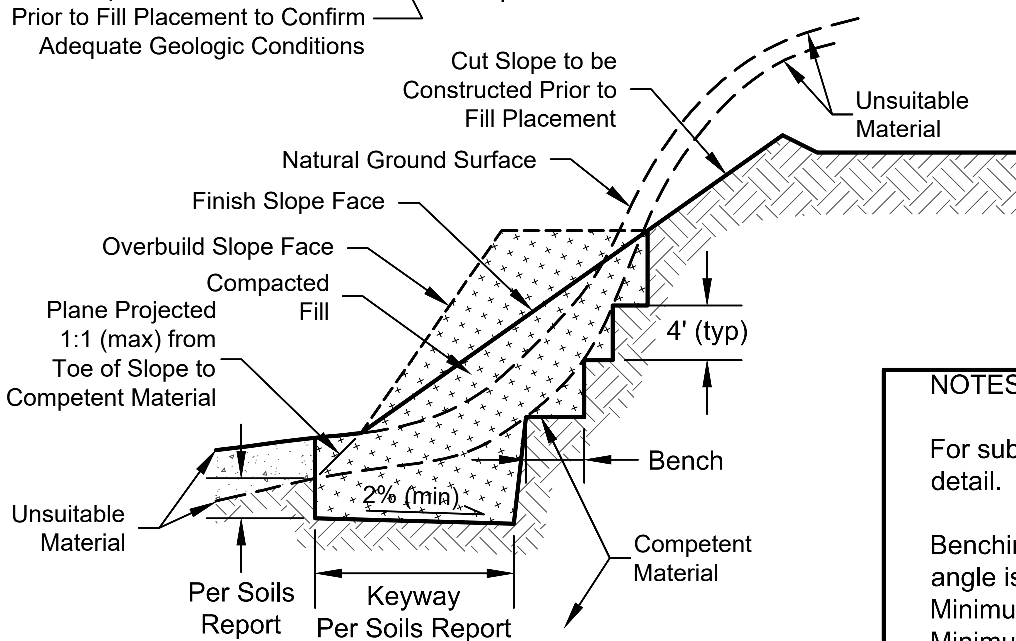
FILL SLOPE



FILL OVER CUT SLOPE



CUT OVER FILL SLOPE



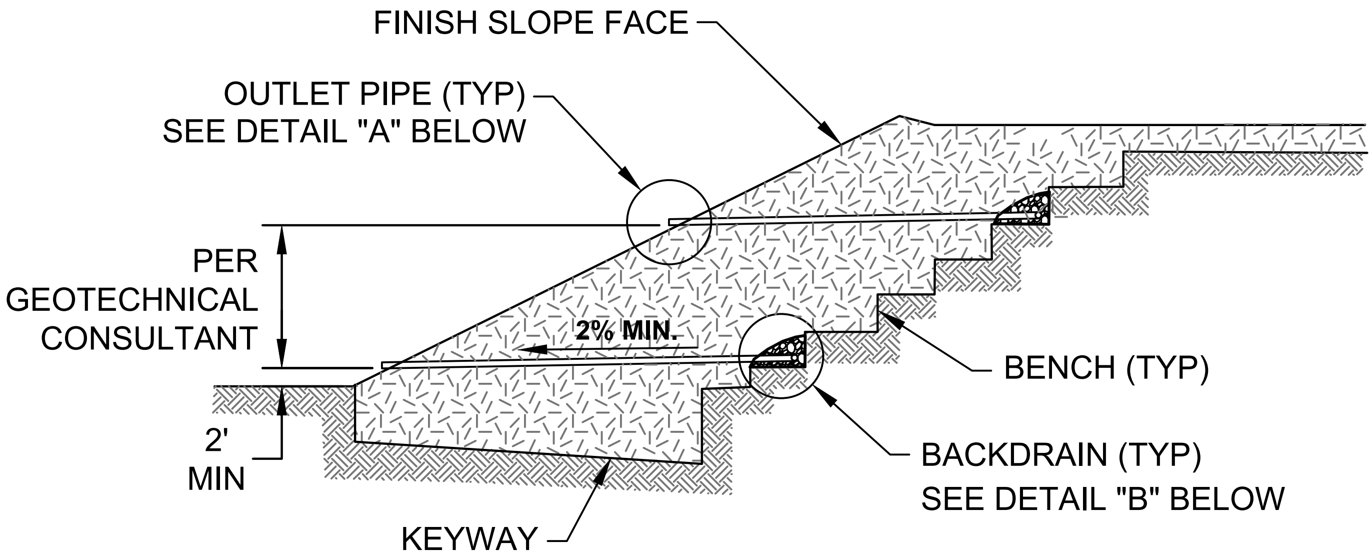
NOTES:

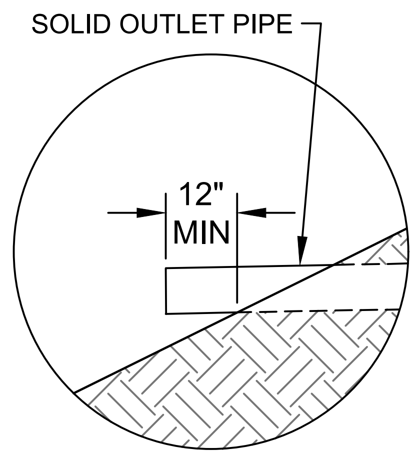
For subdrains see "SLOPE BACKDRAIN" detail.

Benching shall be done when the slope angle is equal to or greater than 5:1. Minimum bench height shall be 4 feet. Minimum fill width shall be 9 feet.

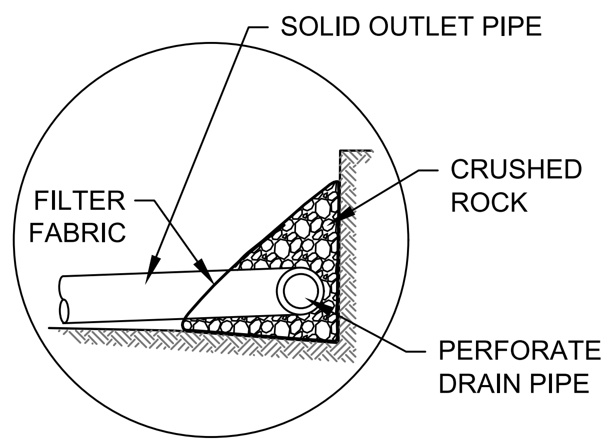
FILL SLOPE CONSTRUCTION

Not To Scale
See attached soils report for specific recommendations





DETAIL "A"



DETAIL "B"

NOTES:

Perforated Drain Pipe should be at least 4 inches in diameter consisting of either Shedule 40 PVC or SDR 35. A min. of 8 perforations per linear foot should be provided along the bottom of pipe. Upstream ends should be provided with a cap. The pipe should slope at a min. 1% gradient toward Outlet Pipes. Glue all joints.

Outlet Pipe should be at least 4 inches in diameter consisting of either shedule 40 PVC or SDR 35. The pipe should slope at a min. 2% gradient toward slope face. Backfill around Outlet Pipe should consist of onsite soils. Provide Outlet Pipe for each 100 feet of Perforated Drain Pipe. Glue all joints. Extend Outlet Pipe 1 foot beyond Finish Slope Face. Glue all joints.

Crushed Rock should conform to the Standard Specifications for Public Works Construction, Section 200-1.2, for 3/4". Provide at least 4 cubic feet per lineal foot of Perforated Drain Pipe. Provide at least 4 inches of gravel below perforated pipe.

Filter Fabric should consist of Mirafi 140N or equivelent. Ends should overlap at least 12 inches.

CALTRANS Class II Permeable Filter Material can be used in lieu of Crushed Rock encased in Filter Fabric.

SLOPE BACKDRAIN

Not To Scale
See attached soils report for specific recommendations

IS/MND Appendix E

Construction Noise Analysis Letter Report

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 **tel**
619.462.0552 **fax**
www.**helixepi**.com

February 28, 2022 00678.00049.001

Mr. Steven Ford
Pulte Group
27401 Los Altos, Suite 400
Mission Viejo, CA 92691

Subject: Quail Valley Regional Water Tank III Project – Construction Noise Analysis

Dear Mr. Ford:

HELIX Environmental Planning, Inc. (HELIX) has performed an analysis of construction noise and vibration impacts for the proposed Quail Valley Regional Water Tank III Project (Project). This letter summarizes the methodology and results of the noise and vibration analysis.

PROJECT LOCATION

The Project site is located east of Interstate 15 (I-15) and west of Interstate 215 (I-215) in the Quail Valley community in the western portion of the City of Menifee, Riverside County (refer to Figure 1, *Regional Location*). The site is located along South Canyon Drive (refer to Figure 2, *Aerial Photograph*).

PROJECT DESCRIPTION

The Project consists of the construction of a 1.63-million-gallon (mg) potable water tank, detention basin, and components that would connect to the existing adjacent water facilities infrastructure (refer to Figure 3, *Site Plan*). The tank would have a height of 40 feet and a diameter of 101 feet.

FUNDAMENTALS OF NOISE/SOUND AND VIBRATION

Noise/Sound

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. Typical A-weighted noise levels are listed in Table 1, *Typical A-Weighted Noise Levels*.

Table 1
TYPICAL A-WEIGHTED NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans 2013

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA units. The threshold of hearing for the human ear is approximately 0 dBA, which corresponds to 20 micro-Pascals (mPa). Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic.

Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dBA—rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dBA changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dBA increase is generally perceived as a distinctly noticeable increase, and a 10-dBA increase is generally perceived as a doubling of loudness.

Vibration

Vibration is defined as any oscillatory motion induced in a structure or mechanical device as a direct result of some type of input excitation. Sources of ground-borne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or manufactured (explosions, trains, machinery, traffic, construction equipment, etc.). Vibration sources may be transient, steady-state (continuous), or pseudo steady-state. Examples of transient construction vibrations are those that occur from blasting with explosives, impact pile driving, demolition, and wrecking balls.

Ambient and source vibration information are expressed in terms of the peak particle velocity (PPV) in inches per second (in/sec). The root mean square (RMS) of a signal is the average of the squared amplitude of the signal in decibels (relative to 1 micro-in/sec). Because the net average of a vibration signal is zero, the RMS amplitude is used to describe the "smoothed" vibration amplitude. The RMS amplitude is always less than the PPV and is always positive. The RMS average is typically calculated over a one-second period.

The background vibration velocity level in residential areas is usually 50 vibration decibels (VdB) or lower; this is well below the level perceptible by humans, which is approximately 65 VdB. Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

EXISTING NOISE SETTING

The Project site is in a rural area with open space to the north, south, and east and rural residential uses to the west, resulting in a relatively quiet existing noise environment. The primary existing noise source in the vicinity is vehicular traffic along Goetz Road, located approximately 1,400 feet west of the site, and occasional vehicles passing by on South Canyon Drive, located immediately adjacent to the northwestern boundary of the site. Other sources of noise include occasional aircraft and typical rural residential sources such as barking dogs and mechanical equipment.

Two 10-minute ambient noise measurements were conducted at the Project site on February 1, 2022, one in the southeastern portion of the site by the existing water tank and one in the northwestern portion of the site by South Canyon Road (refer to Figure 4, *Noise Measurement Locations*). The results of the measurements are shown in Table 2, *Ambient Noise Measurement Survey*. The primary difference between the two measured noise levels is that no vehicles passed by the site along South Canyon Road during measurement M1 while 10 vehicles, including two medium trucks, passed by the site along South Canyon Road during measurement M2.

Table 2
AMBIENT NOISE MEASUREMENT SURVEY

Measurement	Location	Time	Noise Level (dBA L_{EQ})
M1	Southeastern	2:31 p.m. – 2:41 p.m.	41.0
M2	Northwestern	2:46 p.m. – 2:56 p.m.	51.6

EXISTING NOISE-SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise and generally include residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations are considered "vibration-sensitive." The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools.

NSLUs and vibration-sensitive land uses in the project vicinity include a single-family residence immediately southwest of the Project site and additional single-family residences further to the west.

REGULATIONS

City of Menifee Development Code

Section 9.210.060 (Noise Control Regulations) of the City of Menifee Development Code (2021) sets forth that no person shall create sound, or allow the creation of sound, on property that causes the exterior and interior sound level on another occupied property to exceed the sound level standards shown in Table 3, *Stationary Source Noise Standards*.

Table 3
STATIONARY SOURCE NOISE STANDARDS

Time	Interior Standards	Exterior Standards
10:00 p.m. to 7:00 a.m.	40 dBA L_{EQ} (10-minute)	45 dBA L_{EQ} (10-minute)
7:00 a.m. to 10:00 p.m.	55 dBA L_{EQ} (10-minute)	65 dBA L_{EQ} (10-minute)

The following construction-related exceptions are exempt from the provisions of Section 9.210.060:

- Private construction projects, with or without a building permit, located 0.25 mile or more from an inhabited dwelling.
- Private construction projects, with or without a building permit, located within 0.25 mile from an inhabited dwelling, shall be permitted Monday through Saturday, except on nationally recognized holidays, 6:30 a.m. to 7:00 p.m. There shall be no construction permitted on Sunday or nationally recognized holidays unless approval is obtained from the City Building Official or City Engineer.
- Construction-related exceptions. If construction occurs during off hours or exceeds noise thresholds, an application for a construction-related exception shall be made using the temporary use application provided by the Community Development Director in Chapter 9.110 of the City's Development Code.

California Department of Transportation

The California Department of Transportation (Caltrans), in its *Transportation and Construction Vibration Guidance Manual* (Caltrans 2020), presents vibration criteria related to both human annoyance and building damage. These criteria are shown in Table 4, *Caltrans Vibration Human Annoyance Potential Criteria*, and Table 5, *Caltrans Vibration Building Damage Potential Criteria*, respectively.

Table 4
CALTRANS VIBRATION HUMAN ANNOYANCE POTENTIAL CRITERIA

Human Response	Maximum PPV (in/sec) Transient Sources	Maximum PPV (in/sec) Steady State Sources
Barely perceptible	0.035	0.012
Distinctly perceptible	0.24	0.035
Strongly perceptible	0.9	0.1

Source: Caltrans 2020

Table 5
CALTRANS VIBRATION BUILDING DAMAGE POTENTIAL CRITERIA

Structure and Condition	Limiting PPV (in/sec)
Historic and some old buildings	0.5
Residential structures	0.5
New residential structures	1.0
Industrial buildings	2.0
Bridges	2.0

Source: Caltrans 2020

ANALYSIS AND IMPACTS

On-site Construction Noise

Construction of the proposed Project would involve demolition of existing concrete pipes, swales, and riprap; site preparation; grading; underground utilities installation; tank construction; paving; and application of architectural coatings on the tank. The magnitude of the noise impact would depend on the type of construction activity, equipment used, duration of each construction phase, distance between the noise source and receiver, and intervening structures. Construction would generate elevated noise levels that would by audible at nearby residential uses. Excess materials generated during demolition, site preparation, and grading would be transported to a location within the Project site; therefore, on-road haul truck trips are not anticipated.

Construction equipment would not all operate at the same time or location. Furthermore, construction equipment would not be in constant use during the 8-hour operating day. Table 6, *Construction Equipment Reference Noise Levels*, provides the reference 50-foot distance noise levels for construction equipment expected to be used for the Project.

Table 6
CONSTRUCTION EQUIPMENT REFERENCE NOISE LEVELS

Unit	Percent Operating Time	dBA L_{MAX} at 50 feet	dBA L_{EQ} at 50 feet
Air Compressor	40	77.7	73.7
Concrete Mixer Truck	40	78.8	74.8
Concrete Pump Truck	20	81.4	74.4
Crane	16	80.6	72.6
Crawler Dozer	40	81.7	77.7
Dump Truck	40	76.5	72.5
Excavator	40	80.7	76.7
Paver	50	77.2	74.2
Roller	20	80.0	73.0
Water Truck	40	74.3	70.3
Welder	40	74.0	70.0

Source: U.S. Department of Transportation 2008

Each phase of construction would include a combination of equipment that would have the potential to operate simultaneously at the site. The pieces of equipment would be mobile across the Project site over the course of a workday. Accordingly, for analysis purposes, an average distance from the approximate center of the work area for each construction phase to the residential property to the southwest, which is the closest NSLU to the Project site, is used to calculate expected noise levels. Demolition, site preparation, grading, and underground utility installation would occur throughout the site; therefore, a distance of 130 feet is used. Tank construction, paving, and architectural coating would occur at the proposed tank location; therefore, a distance of 100 feet is used. The equipment combinations by construction phase, average distances to the receptor property, and calculated noise levels are presented in Table 7, *Simultaneous Construction Equipment Noise Levels.* The noise levels presented are anticipated to be the highest noise levels that would occur during construction of the Project.

Table 7
SIMULTANEOUS CONSTRUCTION EQUIPMENT NOISE LEVELS

Phase	Equipment Combination	Average Distance to Receptor	Noise Level (dBA L_{EQ})
Demolition	2 crawler dozers, 1 water truck, 1 dump truck	130 feet	73.3
Site Preparation	2 crawler dozers, 1 water truck, 1 dump truck	130 feet	73.3
Grading	2 crawler dozers, 1 water truck, 1 dump truck	130 feet	73.3
Underground Utilities	1 excavator, 1 crawler dozer, 1 water truck	130 feet	72.4
Tank Construction	1 crane, 1 welder, 1 concrete mixer truck, 1 concrete pump truck	100 feet	73.3
Paving	1 roller, 1 paver	100 feet	70.6
Architectural Coating	1 air compressor	100 feet	67.7

Source: U.S. Department of Transportation 2008

Per the City's Development Code, construction projects located within 0.25 mile from an inhabited dwelling are permitted Monday through Saturday from 6:30 a.m. to 7:00 p.m. Project construction would occur within these hours and would therefore be in compliance with the City's Development Code as related to construction noise; however, Project construction would generate noise that would represent a substantial increase over ambient levels (refer to Table 2). Therefore, construction noise impacts are considered potentially significant and mitigation measure NOI-1 would be required to reduce impacts to a less than significant level.

NOI-1 **Construction Noise Management Plan**. Noise from Project construction activities shall comply with the limits and hours specified in the City of Menifee Development Code. Construction shall not occur outside the hours of 6:30 a.m. and 7:00 p.m. Monday through Saturday. No construction shall occur on Sunday or nationally recognized holidays unless approval is obtained from the City Building Official or City Engineer. Though the Project would be exempt, the 65-dBA L_{EQ} exterior noise standard for stationary sources per Section 9.210.060 of the City of Menifee Development Code is used herein as a construction noise performance standard, with an adjusted time-averaged noise level duration appropriate for construction. Construction noise shall not exceed 65 dBA L_{EQ} (8-hour) at nearby residential land uses.

Appropriate measures shall be implemented to reduce construction noise, including, but not limited to, the following:

- Construction equipment shall be properly outfitted and maintained with manufacturer-recommended noise-reduction devices.
- Diesel equipment shall be operated with closed engine doors and equipped with factory-recommended mufflers.
- Mobile or fixed "package" equipment (e.g., arc-welders and air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible.

- Unnecessary idling of internal combustion engines (e.g., in excess of 5 minutes) shall be prohibited.

- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

- No Project-related public address or music system shall be audible at any adjacent sensitive receptor.

- Trucks or equipment equipped with back-up alarm moving within 300 feet of a NSLU should have the normal back-up alarm disengaged and safety provided by lights and flagman or broad-spectrum noise backup alarm (as appropriate for conditions) used in compliance with the Occupational Safety and Health Administration safety guidelines.

- Temporary sound barriers or sound blankets shall be installed between construction operations and adjacent residences. The Project Contractor shall construct a temporary noise barrier of a height breaking the line of sight between the equipment and nearby receptors and meeting the specifications listed below (or of a Sound Transmission Class [STC] 19 rating or better) to attenuate noise.

- If a temporary barrier is used, all barriers shall be solid and constructed of wood, plastic, fiberglass, steel, masonry, or a combination of those materials, with no cracks or gaps through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove or close butted seams and must be at least 3/4-inch thick or have a surface density of at least 3.5 pounds per square-foot. Sheet metal of 18-gauge (minimum) may be used if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Noise blankets, hoods, or covers also may be used, provided they are appropriately implemented to provide the required sound attenuation.

- Residents within 200 feet of the Project's disturbance area shall be notified in writing within one week of construction activity. The notification shall describe the activities anticipated, provide dates and hours, and provide contact information with a description of a complaint and response procedure.

- The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process for the affected resident shall be established prior to construction commencement to allow for resolution of noise problems that cannot be immediately solved by the site supervisor.

Construction Traffic Noise

During grading, the Project is anticipated to require the import of 22,636 cubic yards of soil resulting in a total of 2,830 haul truck trips along South Canyon Drive over the course of the grading phase, which is anticipated to last 41 days. This equates to 69 truck trips per day and 6 truck trips per hour over the course of a 12-hour workday. Six trucks per hour traveling at a speed of 25 miles per hour would generate a noise level of 55.6 dBA L_{EQ}[1]. This would represent a 4-dBA increase over the ambient noise level of 51.6 dBA L_{EQ} measured along South Canyon Drive (refer to Table 2), which is less than the 5-dBA distinctly noticeable increase in noise levels. Therefore, while the movement of haul trucks used for import of material during the Project's grading phase may be audible over the short term, it would not result in a substantial increase over ambient noise levels. In addition, the calculated noise level of 55.6 dBA L_{EQ} is below the 65-dBA L_{EQ} exterior noise standard for stationary sources set forth in the City of Menifee Development Code. Impacts associated with construction traffic would be less than significant.

Construction Vibration

The main source of vibration during Project construction would be a vibratory roller, which would primarily be used to achieve soil compaction for the tank foundation and new pavement around the tank. Due to its mobile nature of operations, the use of a vibratory roller during construction would occur at an average distance, over the course of a workday, of 170 feet from the nearest off-site residential dwelling to the southwest.[2] A vibratory roller creates approximately 0.21 in/sec PPV at a distance of 25 feet. At a distance of 170 feet, a vibratory roller would create a PPV of 0.025 in/sec.[3] This would be below the 0.035-in/sec PPV distinctly perceptible human annoyance potential criteria for continuous/frequent intermittent sources and below the 0.5-in/sec PPV damage potential criteria for residential structures, as provided in Caltrans' *Transportation and Construction Vibration Guidance Manual* (Caltrans 2020). In addition, the use of a vibratory roller would be temporary. As such, vibration impacts would be less than significant.

CLOSING

We appreciate the opportunity to work with you on this Project. Please let us know if you have any questions or require any further information.

Regards,

Hunter Stapp

Hunter Stapp
Noise Analyst

Joanne M. Dramko, AICP
Principal Noise Specialist

Attachments:

Figure 1, Regional Location
Figure 2, Aerial Photograph
Figure 3, Site Plan
Figure 4, Noise Measurement Locations

---

1 Noise level calculated using the Federal Highway Administration's Traffic Noise Model Version 2.5.

2 This distance of 170 feet is measured from the approximate center of the proposed tank construction area to the residential dwelling unit to the southwest.

3 Equipment PPV = Reference PPV * $(25/D)^n$(in/sec), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receptor in feet, and n= 1.1 (the value related to the attenuation rate through the ground); formula from Caltrans 2020.

REFERENCES

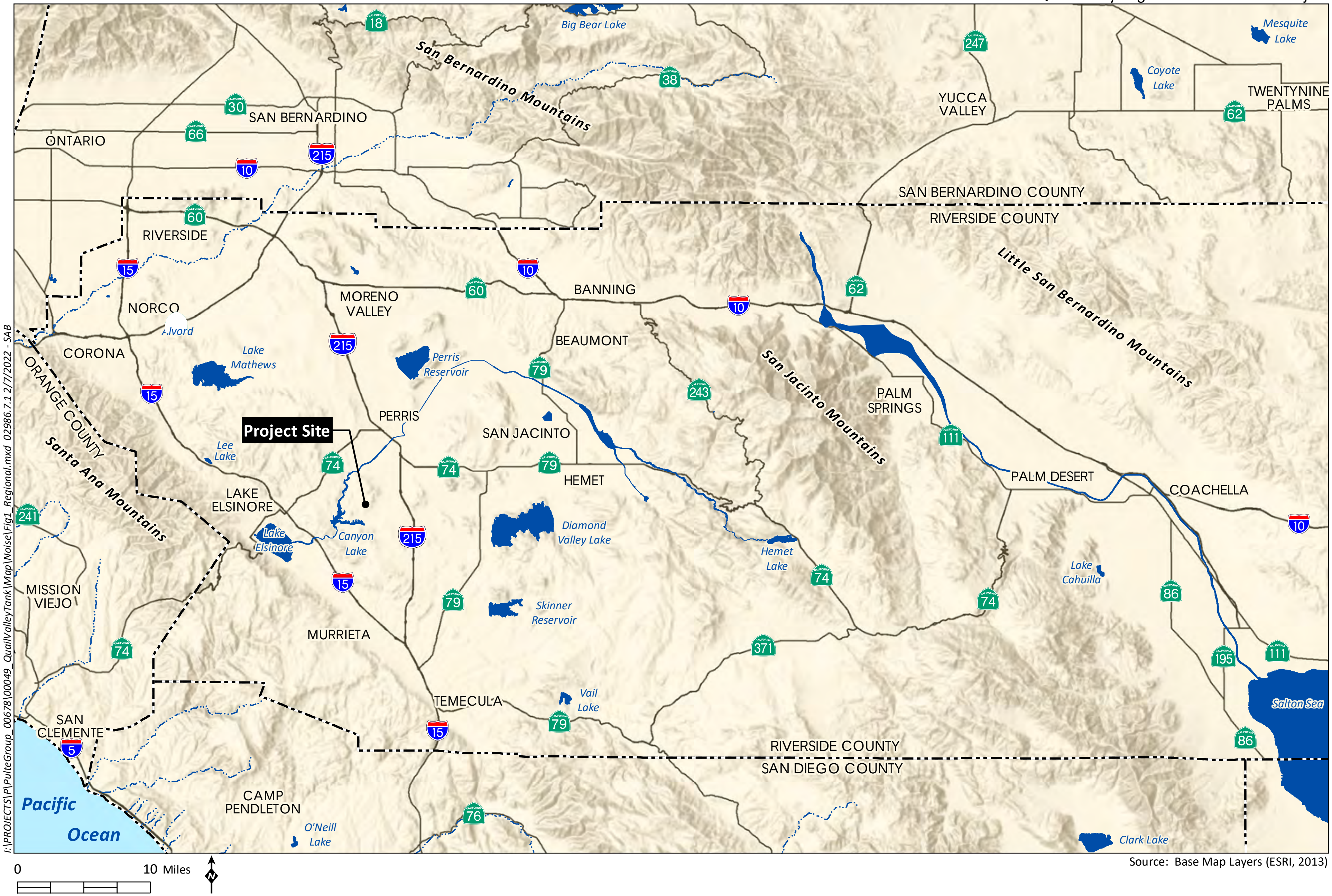
California Department of Transportation (Caltrans). 2020. Transportation and Construction Vibration Guidance Manual. April.

2013. Technical Noise Supplement to the Traffic Noise Protocol. September.

Federal Highway Administration. 2004. Traffic Noise Model Version 2.5.

Menifee, City of. 2021. Development Code. October 1.

U.S. Department of Transportation (USDOT). 2008. Roadway Construction Noise Model (RCNM).



Source: Base Map Layers (ESRI, 2013)

HELIX
Environmental Planning

Regional Location

Figure 1

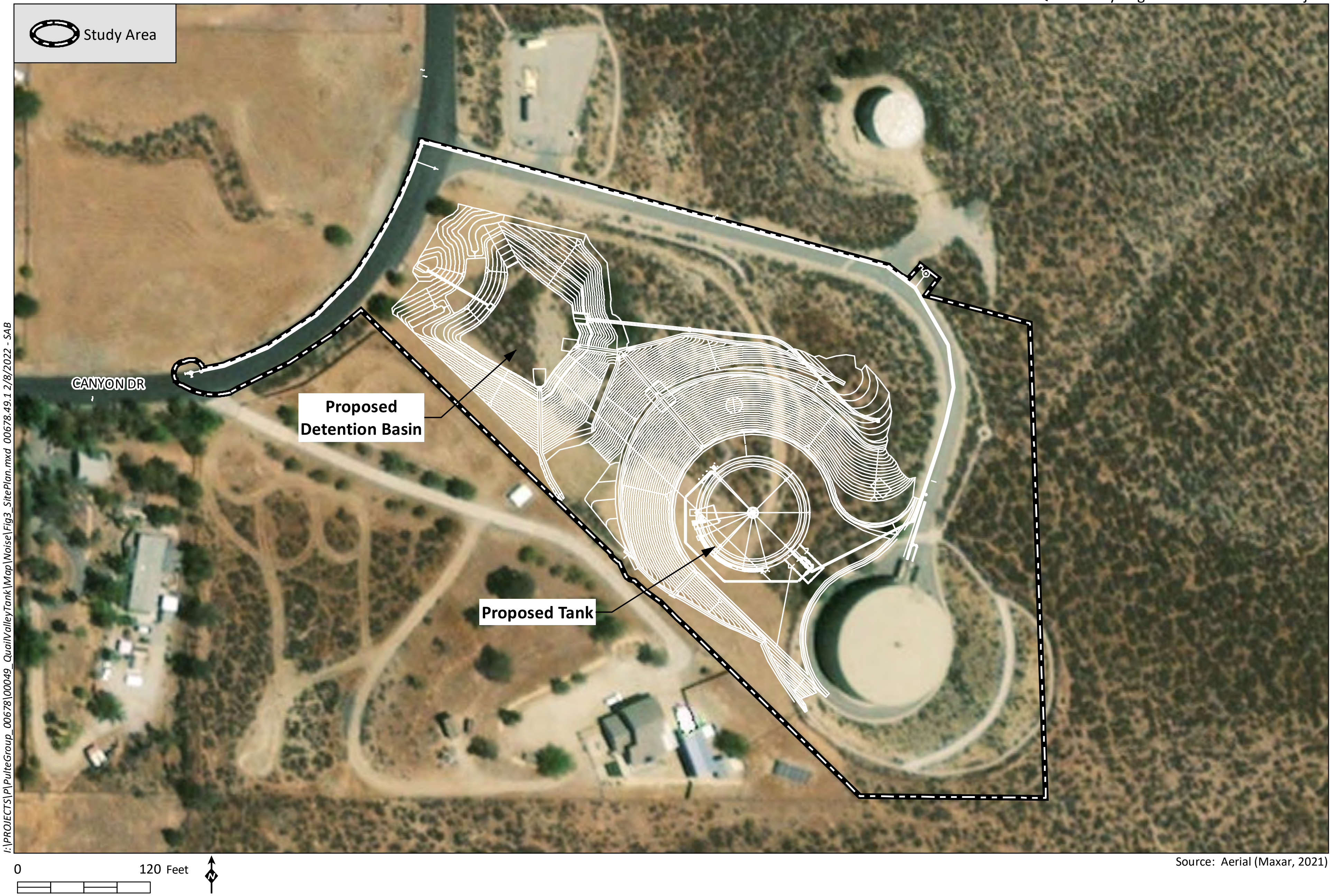
Source: Aerial (Maxar, 2021)

I:\PROJECTS\P\PulteGroup_00678\00049_QuailValleyTank\Map\Noise\Fig2_Aerial.mxd 00678.49.1 2/8/2022 - SAB

HELIX
Environmental Planning

Aerial Photograph

Figure 2



Source: Aerial (Maxar, 2021)

HELIX Environmental Planning

Site Plan

Figure 3

Source: Aerial (Maxar, 2021)

HELIX Environmental Planning

Noise Measurement Locations

Figure 4