Print Form

Notice of Determination

Appendix D

To:
☒ Office of Planning and Research
U.S. Mail: P.O. Box 3044, Sacramento, CA 95812-3044
Street Address: 1400 Tenth St., Rm 113, Sacramento, CA 95814

☒ County Clerk
County of: Riverside
Address: 2724 Gateway Drive, Riverside, CA 92507

From:
Public Agency: Eastern Municipal Water District
Address: 2270 Trumble Road, P.O. Box 8300, Perris, CA 92570
Contact: Joseph Broadhead
Phone: 951-928-3777 ext 4545

Lead Agency (if different from above):
Address:
Contact:
Phone:

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2023010460

Project Title: Los Alamos Hills Water System Project

Project Applicant: Eastern Municipal Water District

Project Location (include county): Portions of Los Alamos Rd, Celia Rd, Mason Rd, Mary Pl and Ellen Way; City of

Project Description:
The project consists of annexation of up to 50 parcels totaling 171.91 acres ("Los Alamos Hills") to Eastern Municipal Water District's water service area, as well as construction/operation of 10,685 linear feet of 8- and 12-inch water pipeline with fire hydrants within city street rights-of-way to provide potable water to landowners that opt to connect.

This is to advise that the Eastern Municipal Water District (☒ Lead Agency or ☐ Responsible Agency) has approved the above described project on March 15, 2023 (date) and has made the following determinations regarding the above described project.

1. The project [☐ will ☒ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
6. Findings [☐ were ☒ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:
Eastern Municipal Water District, 2270 Trumble Road, Perris, CA 92572

Signature (Public Agency): Joe Broadhead Title: Principal Water Resources Specialist

Date: March 15, 2023 Date Received for filing at OPR:

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011

State of California – Department of Fish and Wildlife

2023 ENVIRONMENTAL DOCUMENT FILING FEE
CASH RECEIPT
DFW 753.5a (REV. 01/01/23) Previously DFG 753.5a

RECEIPT NUMBER: 23-70257

STATE CLEARINGHOUSE NUMBER *(If applicable)*: 2023010460

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

LEAD AGENCY	LEADAGENCY EMAIL	DATE
EASTERN MUNICIPAL WATER DISTRICT	STRATTONH@EMWD.ORG	03/15/2023

COUNTY/STATE AGENCY OF FILING	DOCUMENT NUMBER
RIVERSIDE	E-202300295

PROJECT TITLE
LOS ALAMOS HILLS WATER SYSTEM PROJECT

PROJECT APPLICANT NAME	PROJECT APPLICANT EMAIL	PHONE NUMBER
EASTERN MUNICIPAL WATER DISTRICT	STRATTONH@EMWD.ORG	(951) 928-3777

PROJECT APPLICANT ADDRESS	CITY	STATE	ZIP CODE
2270 TRUMBLE ROAD,	PERRIS	CALI	92570

PROJECT APPLICANT *(Check appropriate box)*
☐ Local Public Agency ☐ School District ☒ Other Special District ☐ State Agency ☐ Private Entity

CHECK APPLICABLE FEES:

☐ Environmental Impact Report (EIR)	$3,539.25	$
☒ Mitigated/Negative Declaration (MND)(ND)	$2,764.00	$ $2,764.00
☐ Certified Regulatory Program (CRP) document - payment due directly to CDFW	$1,305.25	$
☐ Exempt from fee		
☐ Notice of Exemption (attach)		
☐ CDFW No Effect Determination (attach)		
☐ Fee previously paid (attach previously issued cash receipt copy)		
☐ Water Right Application or Petition Fee (State Water Resources Control Board only)	$850.00	$
☒ County documentary handling fee		$ $50.00
☐ Other		$

PAYMENT METHOD:
☐ Cash ☒ Credit ☐ Check ☐ Other **TOTAL RECEIVED** $ $2,814.00

SIGNATURE	AGENCY OF FILING PRINTED NAME AND TITLE
X C. Sandoval	Deputy Cassandra Sandoval

ORIGINAL - PROJECT APPLICANT COPY - CDFW/ASB COPY - LEAD AGENCY COPY - COUNTY CLERK DFW 753.5a (Rev. 01/01/2023)

Lead Agency: EASTERN MUNICIPAL WATER DIST.
ATTN: JOSEPH BROADHEAD
Address: 2270 TRUMBLE ROAD
PERRIS, CA. 92570

FILED / POSTED
County of Riverside
Peter Aldana
Assessor-County Clerk-Recorder
E-202300295
03/15/2023 02:06 PM Fee: $ 2814.00
Page 1 of 2
Removed: By: Deputy

Project Title

LOS ALAMOS HILLS WATER SUPPLY SYSTEM

Filing Type

- ☐ Environmental Impact Report
- ☑ Mitigated/Negative Declaration
- ☐ Notice of Exemption
- ☐ Other:

Notes

Mitigation, Monitoring, and Reporting Program

The California Environmental Quality Act (CEQA) requires the adoption of feasible mitigation measures to reduce the severity and magnitude of potentially significant environmental impacts associated with project development. In order to ensure that the mitigation measures and project revisions identified in an Environmental Impact Report (EIR) or Mitigated Negative Declaration (MND) are implemented, the Lead Agency is required to adopt a program for monitoring and reporting on the measures it has imposed to mitigate or avoid significant effects (CEQA Guidelines Section 15097[a]). The CEQA Guidelines require that a Mitigation Monitoring and Reporting Program (MMRP) be adopted upon certification of an EIR or adoption of an MND to ensure mitigation measures identified in the EIR or MND are implemented.

According to CEQA Guidelines Section 15097(c), "reporting" generally consists of a written compliance review that is presented to the decision-making body or authorized staff person. A report may be required at various stages during project implementation or upon completion of the mitigation measure. "Monitoring" is generally an ongoing or periodic process of project oversight. This program identifies, at a minimum, the entity responsible for the monitoring, what is to be monitored, how the monitoring shall be accomplished, and the monitoring and reporting schedule.

The MMRP assigns responsibility for monitoring mitigation measures incorporated into the Los Alamos Hills Water System Project (project). Under this program, the Eastern Municipal Water District (District), and the construction contractor under the direction of the District, would be responsible for the implementation and monitoring of these measures before, during, and immediately following construction phases of the project unless otherwise stated herein, in accordance with CEQA Guidelines Section 15097. A record of the MMRP will be maintained at the District office, located at 2270 Trumble Road, Perris, California 92570.

The Initial Study/MND (State Clearinghouse Number 2023010460) analyzed the potential environmental effects of the project and identified measures to mitigate potentially significant impacts associated with construction of the project. The MMRP table presented below documents the mitigation measures to be implemented by the District.

Mitigation, Monitoring, and Reporting Program Incorporated into the Project			
Mitigation Measure	Timing of Verification	Responsible for Verification	Status/ Date/ Initials
Biological Resources			
BIO-1: Coastal California Gnatcatcher Project construction should be conducted outside the coastal California gnatcatcher breeding season, which is March 1 to August 15. If construction must take place during the coastal California gnatcatcher breeding season, a qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(A) Recovery Permit) shall survey Riversidean sage scrub adjacent to the project site for the presence of the coastal California gnatcatcher. Surveys for coastal California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the U.S. Fish and Wildlife Service (USFWS) within the breeding season prior to the commencement of any construction. If the protocol survey concludes that no coastal California gnatcatchers are present or all work is constructed outside of the breeding season (August 16 to February 28), no additional mitigation measures would be necessary. If coastal California gnatcatchers are present, then the following additional mitigation conditions must be met: a. Between March 1 and August 15, no construction activities shall occur within any portion of the project site where construction activities would result in noise levels exceeding 60 A-weighted decibels [dB(A)] hourly average (or ambient, whichever is higher) at the edge of occupied coastal California gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 dB(A) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by District at least two weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; or b. At least two weeks prior to the commencement of construction activities during the breeding season, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dB(A) hourly average (or ambient, whichever is higher) at the edge of habitat occupied by the coastal California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed the noise threshold. If	Prior to Construction and During Construction	District/ Qualified Biologist	

Mitigation, Monitoring, and Reporting Program Incorporated into the Project			
Mitigation Measure	Timing of Verification	Responsible for Verification	Status/ Date/ Initials
the noise attenuation techniques implemented are determined inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16); or c. Prior to construction during the breeding season, the District shall prepare an MSHCP Consistency Analysis for review by the Western Riverside County Regional Conservation Authority and obtain incidental take coverage for coastal California gnatcatcher via the Participating Special Entity process. The proposed project would pay any necessary mitigation fees for impacts to 7.91 acres prior to construction.			
BIO-2: Migratory and Nesting Birds Construction should be conducted outside the nesting season, which is generally defined as January 15 to August 31. If construction must take place during the nesting season, a qualified biologist shall perform a pre-construction survey for nesting birds. The nesting bird survey shall occur no more than seven days prior to the start of construction. Additionally, raptors (birds of prey) are known to begin nest building in January or February. If construction is to occur between January 1 and February 15, a nesting raptor survey will be conducted within the project area, 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 a qualified biologist until a qualified biologist has verified that the young have fledged or the nest has otherwise become inactive.	Prior to Construction and During Construction	District/ Qualified Biologist	
BIO-3: Aquatic Resources The applicant for the proposed project shall avoid indirect impacts to potentially jurisdictional features with best management practices (BMPs), such as the use of silt fences, fiber rolls, and/or gravel bags, implemented. No equipment maintenance or fueling should be performed within or near the non-vegetated channel where petroleum products or other pollutants from the equipment may enter this area.	During Construction	District/ Qualified Biologist	
Geology and Soils			

Mitigation, Monitoring, and Reporting Program Incorporated into the Project			
Mitigation Measure	Timing of Verification	Responsible for Verification	Status/ Date/ Initials
GEO-1: Paleontological Monitor Excavation 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.	During Construction	District/ Qualified Paleontologist	
Noise			
NOI-1: Construction Noise Reduction Measures • District shall require its contractor to implement the following actions relative to construction noise: District shall conduct construction activities between 7:00 a.m. and 8:00 p.m. on weekdays in accordance with the City of Murrieta Municipal Code, Section 16.30.130(A). • Prior to construction, the District in coordination with the construction contractor, shall provide written notification to all properties within 50 feet of the proposed project facilities informing occupants of the type and duration of construction activities. Notification materials shall identify a method to contact the District's program manager with noise concerns. Prior to construction commencement, the District program manager shall establish a noise complaint process to allow for resolution of noise problems. This process shall be clearly described in the notifications. • Stationary noise-generating equipment shall be located as far from sensitive receptors as possible. Such equipment shall also be oriented to minimize noise that would be directed toward sensitive receptors. Whenever possible, other non-noise generating equipment (e.g., roll-off dumpsters) shall be positioned between the noise source and sensitive receptors. • Equipment and staging areas shall be located as far from sensitive receptors as possible. At the staging location, equipment and materials shall be kept as far from adjacent sensitive receptors as possible. • Construction vehicles and equipment shall be maintained in the best possible working order; operated by an experienced, trained operator; and shall utilize the best available noise control techniques	Prior to Construction and During Construction	District/ Construction Contractor	

Mitigation, Monitoring, and Reporting Program Incorporated into the Project			
Mitigation Measure	Timing of Verification	Responsible for Verification	Status/ Date/ Initials
(including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds). • Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would require turning off equipment if it would idle for five or more minutes. • Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible. • The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.			

Final
Initial Study/Mitigated Negative Declaration
Los Alamos Hills Water System Project
Murrieta, California

Prepared for
Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572-8300

Prepared by
RECON Environmental, Inc.
3111 Camino del Rio North, Suite 600
San Diego, CA 92108
P 619.308.9333

March 8, 2023

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

FIGURES

TABLES

PHOTOGRAPHS

APPENDICES (Under Separate Cover)

Initial Study/Environmental Checklist and Mitigated Negative Declaration for the Los Alamos Hills Water System Project, Murrieta, California

Letters of Comment and Responses

The following letters of comment were received during the public review period (January 24, 2023, to February 23, 2020) of the Draft Initial Study/Environmental Checklist and Mitigated Negative Declaration (IS/MND). A copy of each comment letter along with corresponding staff responses is included here. The comments received did not affect the conclusions of the document and no changes to the text of the Draft IS/MND were required. In accordance with Public Resources Code Section 21081.6., Chapter 7 of this Final IS/MND contains the Mitigation Monitoring and Reporting Program.

Letter A

AUGUSTINE BAND OF CAHUILLA INDIANS
PO Box 846 84-481 Avenue 54 Coachella CA 92236
Telephone: (760) 398-4722
Fax (760) 369-7161
Tribal Chairperson: Amanda Vance
Tribal Vice-Chairperson: Victoria Martin
Tribal Secretary: Geramy Martin

Date: 02/01/2023

Dear Joseph Broadhead
Principal Water Resources Specialist-CEQA

Subject: Notice of Intent to Adopt a Mitigated Negative Declaration Los Alamos Hills Water System Project

A-1 Thank you for the opportunity to offer input concerning the development of the above-identified project. We appreciate your sensitivity to the cultural resources that may be impacted by your project and the importance of these cultural resources to the Native American peoples that have occupied the land surrounding the area of your project for thousands of years. Unfortunately, increased development and lack of sensitivity to cultural resources have resulted in many significant cultural resources being destroyed or substantially altered and impacted. Your invitation to consult on this project is greatly appreciated.

At this time, we are unaware of specific cultural resources that may be affected by the proposed project, however, in the event, you should discover any cultural resources during the development of this project please contact our office immediately for further evaluation.

Very truly yours,

Geramy Martin

Geramy Martin, Tribal Secretary
Augustine Band of Cahuilla Indians

A-1 The District appreciates the knowledge and input of the Augustine Band of Cahuilla Indians regarding the importance and sensitivity of cultural resources. While our record search, survey and consultation did not suggest that sensitive cultural resources are present or would be impacted along the pipeline alignments, in the unlikely and unexpected event that human remains are encountered during construction, the proposed project would follow the requirements of Health & Safety Code §7050.5 and Public Resources Code § 5097.98. Conformance with these regulations would include contacting the County Coroner. If the remains are determined to be of Native American origin, the Most Likely Descendant (MLD), as identified by the Native American Heritage Commission (NAHC), will be contacted to determine proper treatment and disposition of the remains.

Letter B

February 22, 2023

Joseph Broadhead
Principal Water Resource Specialist
Eastern Municipal Water District
P.O. Box 8300
Perris, CA 92572

RECEIVED

Re: *IS/MND Los Alamos Hills Water System Project*

Dear Mr. Broadhead,

B-1 The Los Alamos Hills Water System Project is not in compliance with the relevant provisions of CEQA guidelines.

The City of Murrieta is a responsible agency working in partnership with the lead agency, Eastern Municipal Water District on the Los Alamos Hills Water System Project. The City of Murrieta is funding the project. "Around September 2021, City staff met with representatives from Eastern Municipal Water District (EMWD) to begin discussions about providing water infrastructure to a portion of the Los Alamos area." Murrieta City Council Meeting Agenda Report, August 16, 2022

B-2 **1) The IS/MND makes no mention of the fire hydrants promised for the project and subsequently fails to address erosion control in a post fire event or potential downstream flooding from a severed hydrant that could expose people or structure to significant risks.**

"In addition to the 49 parcels mentioned above, other properties would also benefit from the installation of the water line because fire hydrants would be placed at regular intervals along the new loop system. The presence of fire hydrants will greatly improve fire suppression capabilities and may ultimately

1/20

B-1 The District's Los Alamos Hills project is in full compliance with the relevant provisions of the California Environmental Quality Act (CEQA) and the CEQA Guidelines. Section 12 on page 13 of the Los Alamos Hills Water System Project (Project) Draft Initial Study/Mitigated Negative Declaration (IS/MND) identifies the City of Murrieta (City) as a Responsible Agency. Project funding is provided from the American Rescue Plan Act (ARPA) through the City of Murrieta.

B-2 The project description has been updated on page 10 to confirm that fire hydrants would be included per the District's Engineering Standards, Specifications, and Drawings, B-356. Please see additions made to the Project Description (page 10).

Since there are essentially no curb and gutters within the project area, fire hydrants would be installed with two bollards and a small concrete pad. Fire hydrants would be located at property lines and at low points in lieu of a blow off, where possible. Typically, for new residential development, fire hydrant spacing is determined by the fire authority with jurisdiction for the review and is included in the conditions of approval for the development. For example, Riverside County Ordinance 787.2 indicates that fire hydrants are to be located near street intersections and the minimum fire hydrant spacing is to be 350 feet for new development. National Fire Protection Association Standard 24 has similar requirements for new development. Since there is no new development to be approved in conjunction with this project, coordination with the City of Murrieta and the associated fire authority would be required to determine fire hydrant spacing and locations. A 350-foot minimum spacing should be anticipated.

Erosion control for a post-fire event and the potential for downstream flooding from a severed fire hydrant are not reasonably foreseeable environmental impacts associated with the installation of water lines and fire hydrants. The courts have noted that although CEQA mandates consideration of "reasonably foreseeable indirect physical changes in the environment," a change that is "speculative or unlikely to occur" is not reasonably foreseeable (CEQA Guidelines § 15064.).

result in improved Insurance Service Office ratings." Murrieta City Council Meeting Agenda Report, August 16, 2022

"**WHEREAS,** in addition to the 49 parcels mentioned above, other properties would also benefit from the installation of the water line because fire hydrants would be placed at regular intervals along the new loop system. The presence of fire hydrants will greatly improve fire suppression capabilities and may ultimately result in improved Insurance Service Office ratings;" City of Murrieta Resolution 22-4604, August 16, 2022

"Additionally, there was a recent fire that could have been extinguished with a municipal water system in place." EMWD Los Alamos Hills Certified Mailing Response, Public and Governmental Affairs, December 6, 2022

B-3

2) EMWD and the City of Murrieta failed to provide notice to parcel owners affected by the Los Alamos Hills Water System Project of the opportunity to participate.

"Public participation is an essential part of the CEQA process. Each public agency should include provisions in its CEQA procedures for wide public involvement, formal and informal, consistent with its existing activities and procedures, in order to receive and evaluate public reactions to environmental issues related to the agency's activities. Such procedures should include, whenever possible, making environmental information available in electronic format on the Internet, on a web site maintained or utilized by the public agency." 15201 PUBLIC PARTICIPATION

Our family's first notification for this CEQA project was an EMWD letter dated September 29, 2022. We received a second EMWD letter dated October 11, 2022 inviting our attendance to a town hall meeting scheduled the following day on October 13th, 2022. We were unable to attend the town hall meeting due to a previously committed engagement. There was NO "early September 2022" or

4/20

B-3 The District has exceeded the requirements for CEQA public noticing by utilizing three of the four suggested methods contained in the CEQA Guidelines (CEQA Guidelines § 15072), which requires that a notice of intent to adopt an IS/MND shall be publicized by at least one of the following four procedures to allow the public the review period provided under State CEQA Guidelines Section 15105:

(1) Publication at least once in a newspaper with general circulation.

The District published the Notice of Intent in the Press-Enterprise, a newspaper with general circulation in the project area on January 24, 2023.

(2) Posting of notice by the District on and off the site in the area where the project is to be located.

Posting of notices on and off the site was not practical for a pipeline project of this nature and was not undertaken.

(3) Direct mailing to the owners and occupants of property contiguous to the parcel or parcels on which the project is located. Owners of such property shall be identified as shown on the latest equalized assessment roll.

The District mailed copies of the Notice of Intent to all properties within the proposed annexation area on Wednesday, January 24, 2023.

(4) The alternatives for providing public notice outlined herein shall not preclude the District from providing additional notice by other means if the District so desires, nor shall the requirements of this section preclude the District from providing the public notice at the same time and in the same manner as public notice required by any other laws for the project.

The District posted the Notice of Intent on the District's website on Wednesday, January 24, 2023 (https://www.emwd.org/post/notice-intent-adopt-mitigated-negative-declaration-los-alamos-hills-water-system-project). The District also filed the Notice of Intent with Riverside County and the State Clearinghouse.

"*early October 2022*" letter as EMWD claimed at its EMWD Board of Directors meeting on November 16, 2022. Or is "*For full annexation to be considered it will require a minimum 75% commitment from property owners*" true.

B-4 Information from the town hall meeting on October 13, 2022 was posted on the EMWD web page. An Annexation Application Costs estimate for individual parcel owners based on a 3-acre parcel was $39,950 or $13,317 average per acre. (Annexation costs for a single family home on a 10-acre parcel would be $133,170)

Upon viewing the Murrieta City Council Meeting on August 16, 2022, City Council Member Christi White read verbatim from the City Council Meeting Agenda Report. "As currently proposed, 49 adjacent parcels could benefit from the installation of a water line loop that would connect to existing EMWD infrastructure on Ruth Ellen Way. However, this area is not currently within EMWD's district boundaries. Thus, to connect to the future waterline, each property would first need to annex into the Metropolitan Water District and EMWD. **Fortunately, annexation costs are eligible for funding through ARPA.**"

EMWD Board President Philip Paule and EMWD Deputy General Manager Nick Kanetis spoke about the project at the city council meeting. "*Committed to move it forward aggressively and can find creative ways to move it forward rapidly.*" Also in attendance was EMWD Public Affairs Manager Roxanne Rountree.

No one at the meeting disagreed or refuted that annexation costs are eligible for funding through ARPA.

Our family and perhaps others affected by the Los Alamos Hills Water System Project were unaware of the August 16, 2022 Murrieta City Council meeting. We were not given the opportunity to voice support for the ARPA funds to cover our annexation costs; later estimated by EMWD at $39,950. Nor were we able to request our governmental decision makers to use the ARPA funds to cover water meters and back-flow devices that appear to qualify per the 2017 Drinking Water

3/30

B-4 The IS/MND was not on the agenda or discussed at the City of Murrieta meetings referenced in this comment. The Eastern Municipal Water District does not control items discussed at the City of Murrieta, which is a separate governmental entity. The District prepared the IS/MND to address environmental impacts associated with the District's proposed annexation and pipeline project, which will be considered by the District's Board of Directors on March 15, 2023.

State Revolving Fund Eligibility Handbook, or discuss any other concerns about the project. We didn't know about the City Council Meeting.

A one-day notice for a town hall meeting/workshop to parcel owners affected by this CEQA project, after both agencies have worked on this project for over one year, which included public hearings, is contrary to the meaning of 'public participation' as described in 15201.

B-5 **3) Eastern Municipal Water District and the City of Murrieta approved the Los Alamos Hills Water System Project prior to considering the IS/MND.**

"(a) Before granting any approval of a project subject to CEQA, every lead agency or responsible agency shall consider a final EIR or negative declaration or another document authorized by these guidelines to be used in the place of an EIR or negative declaration. See the definition of 'approval' in Section 15352." 15004 – TIME OF PREPARATION

"(a) 'Approval' means the decision by a public agency which commits the agency to a definite course of action in regard to a project intended to be carried out by any person. The exact date of approval of any project is a matter determined by each public agency according to its rules, regulations, and ordinances. Legislative action in regard to a project often constitutes approval.
(b) With private projects, approval occurs upon the earliest commitment to issue or the issuance by the public agency of a discretionary contract, grant, subsidy, loan, or other form of financial assistance, lease, permit, license, certificate, or other entitlement for use of the project." 15352 – APPROVAL

On July 6, 2022 at 5:00, the EMWD Board voted to "Approve and Authorize Interagency Agreement with the City of Murrieta and Agreement with Albert A. Webb Associates ($193,877) for the Los Alamos Hills Water Facilities Project, and Additional Appropriation in the Amount of $355,000".

4/20

B-5 The District has not yet taken action to approve or deny the Los Alamos annexation and water pipeline project. Prior discussions between the District and the City regarding the provision of water infrastructure to the Los Alamos Hills community helped define the project, which is the subject of the IS/MND. The Board is being asked to adopt the CEQA document for that project, and to advance the project.

On August 16, 2022 the Murrieta City Council unanimously voted for the "Approval of the Interagency Financial Contribution Agreement with Eastern Municipal Water District for the Water District Infrastructure in the Los Alamos Region". "Agreement. District hereby agrees to construct water system infrastructure within Los Alamos Hills (hereinafter, the "Subject Facilities") for purposes of serving approximately 48 privately owned properties within said area. City hereby represents and warrants to District that it has secured and shall contribute a minimum of $3 million of funding toward District's construction of the Subject Facilities and shall endeavor to identify and contribute other potential and additional sources of funding received or otherwise made available for District costs, fees and expenses incurred in connection with District's construction of said water infrastructure as more fully described herein."

The Los Alamos Hills Water System INTERAGENCY FINANCIAL CONTRIBUTION AGREEMENT does not stipulate to CEQA compliance. 15004(b)(4)(A)

On November 16, 2022 at 9:00, the EMWD Board voted to "Adopt Proposed Resolution of the Board of Directors of Eastern Municipal Water District setting a time and place for a public hearing regarding authorization of the Los Alamos Hills Water System Financial Program". EMWD Assistant Chief Financial Officer Thomas Hays announced at this meeting that EMWD had already received $1.5 million from the City of Murrieta for the Los Alamos Hills Water System Project.

On December 7, 2022 at 9:00, the EMWD Board approved "Public Hearing to Adopt Proposed Resolution of the Board of Directors of Eastern Municipal Water District establishing the Los Alamos Hills Water System Financing Program for participants' annexation cost and connection fees".

On December 13, 2022, EMWD held the first Notary Signing Event at no cost for parcel members wishing to participate in EMWD's financing program.

On January 10, 2023, EMWD hosted the final Notary Signing Event. "This will be the final opportunity to partner at no cost on the annexation application. It will

5/20

also be the last opportunity to receive the 30-year financing option for the project. If you choose to postpone your decision, you will be required to file your own LAFCO application and those application fees must be paid by the resident. These fees are approximately $20,000, which are subject to increase."

On January 24, 2023, EMWD posted the IS/MND for the Los Alamos Hills Water System Project indicating 36 parcel agreements.

The Los Alamos Hills Water System Annexation and Connection Fee Financing Agreement does not stipulate CEQA compliance. 15004(b)(4)(B)

B-6

4) Providing adequate public safety is the primary role of government; especially in a *Very High Fire Hazard Severity Zone* with congested traffic and growing number of Electrical Vehicle Fires.

The Los Alamos Hills Water System Project is located in a "Very High Fire Hazard Severity Zone." Parcel owners were evacuated for the Liberty Fire on December 7, 2017. Ted and Kathy's house (next to the Sports Park) burned to the ground on March 7, 2020 due to the absence of fire hydrants. As indicated in the IS/MND both paved and dirt roads in the Los Alamos loop have adjacent vegetation. The vegetation can become a fuel load for fire as experienced during the Liberty Fire.

Electric Vehicle (EV) fires are increasing in frequency as California has mandated higher thresholds for EV production. Fire personnel have described fighting an EV fire is like trying to extinguish a trick birthday candle. Even with an adequate water supply from a hydrant, EV fires can burn for hours. Absent an adequate water supply for fighting an EV fire can result in dire cascading consequences.

To now abandon the installation of fire hydrants as road usage has become congested is contrary to providing adequate public safety in our rural/residential community located in a *Very High Fire Hazard Severity Zone* with a history of fires

6/20

B-6 The IS/MND stated that the Project is located within a Very High Fire Hazard Severity Zone (Section 4.9 (g); page 59). As noted previously, fire hydrants would be included in installation of the proposed water lines, which would provide firefighters much-needed access to water in the event of fire in the project area upon completion.

Again, contrary to what was stated and written at the Murrieta City Council meeting, **"Fortunately, annexation costs are eligible for funding through ARPA."**

Los Alamos Hills parcel owners are yet again short-changed by the Los Alamos Hills Water System Project who had been promised adequate fire protection and lower fire insurance rates.

Kind Regards,

Bob Landwehr
27961 Cella Road
Murrieta, CA 92563

APN: 900-370-001, Parcel #46 on the first map & Parcel #1 on others

Supporting Documentation

- Murrieta City Council Meeting Agenda Report, August 16, 2022
- "Car crash shears fire hydrant on Whitewood", forces road closure
- "Murrieta geyser shoots 125 feet into air after hydrant struck"
- Murrieta Fire Dispatch, March 12, 2000
- EMWD Action/Info Item 5567, July 6, 2022
- EMWD Action/Info Item 5741, November 16, 2022
- EMWD Action/Info Item 5840, December 7, 2022
- Best practices for electric vehicle fires, Fire Rescue 1
- "Video of multiple air tankers working the Liberty Fire"
- "Congestion Ahead" Los Alamos Road sign east of Ruth Ellen Road

7/20

☒ City Council
☐ Redevelopment Successor Agency
☐ Community Services District
☐ Fire District
☐ Library Board
☐ Financing Authority
☐ Housing Authority

City Council Meeting Agenda Report

Subject: Approval of Interagency Financial Contribution Agreement with Eastern Municipal Water District for Water Infrastructure in the Los Alamos Region

Date: August 10, 2022

Prepared by: Ivan Holler, Assistant City Manager

Approved by: Kim Summers, City Manager

RECOMMENDATION

1. Adopt Resolution No. 22-4894 entitled: *A Resolution of the City Council of the City of Murrieta Fiscal Year 2022/23 Operating Budget to Increase Appropriations To Fund The City's Obligation Under an Interagency Financial Contribution Agreement with Eastern Municipal Water District*;
2. Approve the attached Interagency Financial Contribution Agreement with Eastern Municipal Water District to utilize American Relief Plan Act (ARPA) funding for water infrastructure in the Los Alamos region; and
3. Authorize the City Manager to execute the Agreement and make any non-substantive changes and/or updates and to undertake actions necessary to implement the Agreement.

PRIOR ACTION/VOTE

On February 22, 2022, the City Council held a workshop and received public input on the use of Coronavirus State and Local Fiscal Recovery Funds, as established by ARPA. Staff provided preliminary recommendations for funding that included approximately $10.6 million for water and sewer infrastructure (Non-action).

On April 19, 2022, the City Council adopted a Resolution accepting ARPA grant funding, approved a Spending Plan for the City's allocation of the ARPA funds, and amended the City's Operating Budget and Capital Improvement Plan in accordance with the Spending Plan (Vote: 5-0).

CITY COUNCIL GOAL

Maintain a high performing organization that values fiscal sustainability, transparency, accountability, and organizational efficiency.

BACKGROUND

In May 2021, the United States Department of Treasury announced the availability of funds from the American Rescue Plan Act of 2021 (ARPA), related to COVID-19 recovery efforts. Subsequently, in July 2021, staff briefed the City Council on potential uses of ARPA funds, including to provide water and sewer infrastructure to areas of the City that presently rely on individual wells for potable water, and on-site septic systems for wastewater disposal.

8/20

After reviewing the Final Rule from the United States Department of Treasury on uses for ARPA funds and the Drinking Water State Revolving Fund Eligibility Handbook, staff determined that two areas of the City would be eligible to utilize ARPA funds to provide municipal water and sewer service. One of those areas is along a portion of Los Alamos, generally to the south of the Los Alamos Sports Park. This area is primarily zoned for large lot residential uses. Unlike other similarly zoned locations, several wells serving properties in this area have dried-up and are no longer capable of providing potable water to the existing homes. As a result, some residents have resorted to trucking water onto their property to provide for daily needs. Hence, the lack of adequate potable water in this area is a legitimate public health and safety concern.

Around September 2021, City staff met with representatives from Eastern Municipal Water District (EMWD) to begin discussions about providing water infrastructure to a portion of the Los Alamos area. At the City's request, in November 2021, EMWD staff prepared a conceptual layout to install water infrastructure to several parcels in the Los Alamos area. The study area generally runs along the south side of Los Alamos to the properties along both sides of Mary Place, from Ruth Ellen Way on the west to Mason Road on the east (Exhibit A). As currently proposed, 49 adjacent parcels could benefit from the installation of a water line loop that would connect to existing EMWD infrastructure on Ruth Ellen Way. However, this area is not currently within EMWD's district boundaries. Thus, to connect to the future waterline, each property would first need to annex into the Metropolitan Water District and EMWD. Fortunately, annexation costs are eligible for funding through ARPA.

In addition to the 49 parcels mentioned above, other properties would also benefit from the installation of the water line because fire hydrants would be placed at regular intervals along the new loop system. The presence of fire hydrants will greatly improve fire suppression capabilities and may ultimately result in improved Insurance Service Office ratings.

EMWD prepared a preliminary cost estimate of approximately $3.2 million for the planning, design, and construction of the water infrastructure. Final costs may be substantially higher as annexation costs were not included in the preliminary cost estimate.

In February 2022, the City Council held a workshop and received public input on the use of ARPA funds. Staff provided preliminary recommendations for funding projects that included approximately $16.6 million for water and sewer infrastructure. In April 2022, the City Council approved a resolution accepting ARPA funds in the amount of $16,463,101. That amount included the recommended allocation of $10.6 million for water and sewer projects. Staff further recommended allocating up to $3 million out of the $10.6 million to provide water infrastructure to the Los Alamos area, based on EMWD's preliminary cost estimate.

Although the total cost of providing water infrastructure for the Los Alamos area will exceed $3 million, EMWD has agreed to initially cover any additional costs. Ultimately, EMWD would recover those additional costs through the formation of a benefit assessment district, or other similar financing mechanism. Most recently, on July 6, 2022, the EMWD Board approved a draft Interagency Financial Contribution Agreement to plan, design, and construct water infrastructure in the Los Alamos area, utilizing up to $3,000,000 of ARPA funds from the City. This Agreement will allow properties in the Los

9/30

Alamos Hills area the ability to receive municipal water services, as part of a financial partnership and support between EMWD and the City, through the contribution of ARPA funds allocated by the City.

Staff recommends that the City Council also approve the Draft Interagency Financial Contribution Agreement with Eastern Municipal Water District.

ARPA funds must be expended by December 31, 2026.

FISCAL IMPACT

The cost for the Agreement to the City is $3,000,000 and will be funded by ARPA. These funds need to be established in the FY 2022/23 Operating Budget to realize the ARPA grant revenue and expenditures related to this Agreement. The following appropriations are requested as a part of this action:

ATTACHMENTS

1. Resolution No. 22-4604 and Exhibit A – Los Alamos Hills
2. Los Alamos Hills Water System Interagency Financial Contribution Agreement with EMWD

10/20

Patch

Murrieta, CA

Car Crash Shears Fire Hydrant On Whitewood Road In Murrieta

The crash was reported just before 8 p.m. Tuesday on southbound Whitewood Road, just before the Meadowlark Lane intersection.

Murrieta Fire & Rescue crews at Tuesday night's scene. (Joe Fanuselle)

MURRIETA, CA — A solo-car crash Tuesday night in Murrieta sheared a fire hydrant and forced the closure of Whitewood Road due to flooding.

The crash was reported just before 8 p.m. on the southbound side of the road, just before the Meadowlark Lane intersection.

11/21

Patch

Murrieta, CA

Murrieta Geyser Shoots 125 Feet Into Air After Hydrant Is Struck

PHOTOS: It was difficult to miss THIS in town on Thursday...

MURRIETA, CA — A person ran into a fire hydrant in Murrieta on Thursday morning, prompting a geyser to shoot more than 100 feet into the air. The water stream shot approximately 125 feet up as the hydrant was going off around 9:30 a.m..

The incident happened in the area of California Oaks Road and Cal Oaks Plaza.

Images from the scene show the geyser, and subsequent flooding in the area.

Find out what's happening in Murrieta with free, real-time updates from Patch.

bobbandwehr@msn.com

Drivers should allow for extra time Thursday, as crews worked to shut off the water and clear the area.

12/30

MURRIETA FIRE Dispatch

Captain Todd Brailsford removes an American flag from the front of a burning home. (Photo by Jon Foreauilt)

IN THE FIELD REPORTING

By Jon Foreauilt
MFR Volunteer Photographer

On Saturday, March 7, Murrieta Fire & Rescue responded to a residential structure fire along Los Alamos Road, just west of Rush Ellen Way. The first arriving units reported a large, single-story home with smoke and fire showing from the roof. Firefighters sprang into action, quickly deploying an attack line and working to knock down the flames.

Due to water supply constraints (there are no fire hydrants in the area) and strong winds pushing the heat further into the structure, the fire proved to be too much for their efforts, and within a few minutes, the entire home was fully ablaze. The incident was upgraded to a second alarm, and nearly a dozen fire engine companies from Murrieta and surrounding communities arrived at the scene to assist.

(Cont'd on Page 5)

INSIDE THIS ISSUE

INSIDE THIS ISSUE

Check back next week for updated artwork

March 14, 2020

MFR BOX SCORES

	Fires
	Explosion/No Fire
111	EMS
	Traffic Collisions
	Technical Rescue
	Haz/Mat
	Service Calls
	Lift Assists
	Good Intent
	Canceled Calls
	Alarm Activations
	Miscellaneous/Severe weather
	Citizen Complaint
	Total Calls

MFR Calls - QUICK REACTION			
Measurable	90%	MFR	NFPA
Alarm Handling	0:01:00	89.7%	91.0%
Turnout	0:01:25	91.7%	47.4%
Travel	0:05:48	92.5%	43.3%
Total Response	0:07:54	94.9%	52.6%
FIRE CALLS - QUICK REACTION (NFPA 1710)			
Measurable	90%	MFR	NFPA
Alarm Handling	0:01:15	92.3%	75.7%
Turnout	0:01:35	92.7%	81.4%
Travel	0:06:12	86.5%	29.7%
Total Response	0:10:54	94.0%	35.9%

FIRE PREVENTION/COMMUNITY RISK	
Construction - New and Tenant Improvement	
Planning Design Reviews	9
Plan Submittals	17
New Construction Inspections	7
Plans & Inspection Revenue	$11,762
Routine and Long-Standing	
Inspections	58
Re-Inspections	18
Number of Violations	63
Routine Fire Inspection Revenue	$3,386
Code Enforcement	1
Public Education	
Public Education Presented	0
Public Education Attendees	35
Fire Investigations	
Investigations	2
Development Fees	
Weekly DIF	$0
Weekly DAF	$0

13/20

IN THE FIELD REPORTING

By Joe Famaglio

MFR Volunteer Photographer

In the Field Reporting (cont'd from Page 1)

As firefighters deployed additional hose lines and worked to contain the fire, fellow fire photographer Ryan Ponits and I noticed an American flag blowing in the wind near the front door of the home. We caught the attention of Murrieta Fire Captain Todd Bradstreet, who quickly removed the flag and handed it off to me.

I began rolling the flag onto the wooden pole and turned around to find a safe place that I could keep it. When I turned back around, I was met by a woman approaching me with her arms stretched and her eyes welled with tears. I handed the flag off to her and returned to my photo-taking duties, but the moment was not lost on me. It was one of those brief instances that brings a glimmer of hope amidst a tragedy, and I was happy to be there to witness it.

Unfortunately, the home was destroyed in the incident, and the family lost virtually all of their possessions. Thankfully, however, no one was injured, and several good Samaritans were able to rescue most of the family's pets from the home as the fire was rapidly growing.

It's common to hear "well, possessions can be replaced, but people/pets cannot." And while this is true, victims of fires and other tragedies will usually tell you that it's impossible to replace the memories and feelings that accompany those possessions. I am hopeful that the preservation of their flag gave the family a new memory for a cherished possession, which they can hopefully use to help start rebuilding their lives.

As always, I want to call out the wonderful job performed by all first responders at the scene today, including Murrieta Fire and Rescue, CAL FIRE/Riverside County Fire Department, the Murrieta Police Department, and AMR Riverside County, among others. Although the home was a total loss, the efforts of these heroes helped overcome some extreme challenges today, including the deployment of a multi-engine relay supply hose line that was over 1,000 feet long, to bring in water from the closest hydrant to the incident. There is no doubt that their efforts helped preserve the life and safety of everyone at the scene, and prevented the situation from becoming much worse.

Need someone to vent with? The Counseling Group: 909-464-6231

14/20

Eastern Municipal Water District
California

Approved

Action/Info Item
5567

Approve and Authorize Interagency Agreement with the City of Murrieta and Agreement with Albert A. Webb Associates ($193,877) for the Los Alamos Hills Water Facilities Project, and Additional Appropriation in the Amount of $355,000

Information

Department: Planning-Engineering-Construction Branch
Sponsors:
Category: Action/Info Item
Meeting Workflows: Board Meeting Workflow

Attachments

Exhibit A – Location Map
Exhibit B – Interagency Agreement
Exhibit C – Consultant Proposal
Exhibit D - Cost Estimate
Presentation

Background

Los Alamos Hills is a rural residential community located within a northeasterly portion of the City of Murrieta (City) as illustrated in Exhibit A. This area of the City is not currently annexed into the service areas of Eastern Municipal Water District (EMWD) or the Metropolitan Water District of Southern California (MWD) and property owners within this area rely solely on privately owned pumping wells for their water supply.

The proposed project will help address potential drywell conditions (failure or over pumping of privately owned wells) and lack of a reliable water supply, as experienced by some residents in the past. The City has reached out to EMWD and offered $3 million in American Rescue Plan Act funding available to support the construction of water infrastructure for the Los Alamos Hills community.

On March 16, 2022, staff requested a proposal from Albert A. Webb Associates (WEBB) to advance a feasibility assessment to define the scope and cost of a water infrastructure extension to the Los Alamos Hills community. This work was authorized (PAR 2022-028) by staff and a total of $52,800 was appropriated to advance this phase of the project.

Having completed an initial feasibility assessment, EMWD is prepared to accept the City's offer of funding and construct the required water infrastructure extension to this community. The designation of roles, cooperative responsibilities, financial participation, and timing has been outlined in an Interagency Agreement that is in the mutual interests of both EMWD and the City for efficient engineering design and construction of the project. The proposed Interagency Agreement is attached as Exhibit B.

The proposed water infrastructure extension would be a looped water system extending from the adjacent 1508 pressure zone. The proposed project would serve approximately 49 properties within the community that front Los Alamos Road, Celia Road, Mary Place, and Mason Road. This will be achieved by installation of approximately 6,720 linear feet of 8-inch diameter pipeline, 4,040 linear feet of 12-inch diameter pipeline, and related appurtenant work.

15/2

2/20/23 2:11 PM Adopt Proposed Resolution of the Board of Directors of Eastern Municipal Water District Setting a Time and Place for a Public Hear...

Eastern Municipal Water District
California

Approved
Nov 28, 2022 9:40 AM

emwd

Action/Info Item
5741

Adopt Proposed Resolution of the Board of Directors of Eastern Municipal Water District Setting a Time and Place for a Public Hearing Regarding Authorization of the Los Alamos Hills Water System Financing Program

Information

Department: Finance
Category: Action/Info Item
Sponsors:
Meeting Workflows: Board Meeting Workflow

Attachments

Exhibit A – Location Map
Exhibit B – Los Alamos Hills Community Parcel Map
Exhibit C – Los Alamos Hills Looped Water System Diagram
Exhibit D – Los Alamos Hills Water System Financing Agreement
Exhibit E – Resolution
Presentation

Background

Located within Eastern Municipal Water District's (EMWD) greater service area boundary is an approximate 1,000-acre area not annexed into the service areas of EMWD or the Metropolitan Water District (MWD). This area is commonly referred to as the "Keyhole" and is located in the city of Murrieta, east of Interstate 215, north of Murrieta Hot Springs Road, and west of Highway 79, as depicted on the attached location map (Exhibit A). Property owners within this area rely on privately owned pumping wells for water supply. Over the years, there have been inquiries from property owners regarding the possibility of obtaining water service from EMWD, but plans have not yet advanced due to complexities related to the long processing times and costs to annex into MWD and EMWD service areas, along with the costs to extend facilities to this area.

In early 2022, following concerns expressed by certain residents within the Keyhole who were experiencing drywell conditions and expressing concerns of having a lack of reliable water supply, the City of Murrieta (City) reached out to EMWD to explore the possibility of extending EMWD's water system to a residential community known as Los Alamos Hills that includes approximately 50 properties (171.9 acres) fronting Los Alamos Road, Calla Road, Mary Place, and Mason Avenue, as depicted in the Los Alamos Hills Community parcel map (Exhibit B). In support of the potential extension of EMWD's water system and potential annexation of these properties, the City of Murrieta committed to providing approximately $3.0 million of American Rescue Plan Act (ARPA) funding available for water infrastructure.

On July 6, 2022, EMWD's Board of Directors approved entering into an Interagency Financial Contribution Agreement with the City for reimbursement of $3.0 million for the Los Alamos Hills Water Facilities Project, and the City Council of the City of Murrieta adopted a resolution approving the action on August 16, 2022.

The proposed water infrastructure extension includes a looped water system extending from the adjacent 1508 pressure zone and will be achieved by installation of approximately 6,720 linear feet of 8-inch diameter pipeline, 4,040 linear feet of 12-inch diameter pipeline, and related auxiliary work, as described in the Los Alamos Hills looped water system diagram (Exhibit C).

https://boards.emwd.org/Citizens/Detail_LegiFile.aspx?MeetingID=1080&MatterFile...

16/20

Eastern Municipal Water District
California

Approved

Action/Info Item
5840

Public Hearing to Adopt Proposed Resolution of the Board of Directors of Eastern Municipal Water District Establishing the Los Alamos Hills Water System Financing Program for Participants Annexation Costs and Connection Fees

Information

Department: Finance
Category: Action/Info Item
Sponsors:
Meeting Workflows: Board Meeting Workflow

Attachments

Synopsis
Exhibit A - Los Alamos Hills Map
Exhibit B - Resolution
Presentation

Background

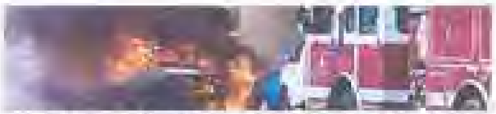
In early 2022, the City of Murrieta reached out to Eastern Municipal Water District (EMWD) to explore the possibility of extending EMWD's water system to a residential community known as Los Alamos Hills that includes approximately 50 properties (171.9 acres) fronting Los Alamos Road, Celia Road, Mary Place, and Mason Avenue, as depicted in the Los Alamos Hills Map (Exhibit A). In support of the potential extension of EMWD's water system and potential annexation of these properties, the City of Murrieta committed to providing approximately $3 million of American Rescue Plan Act (ARPA) funding available for water infrastructure.

On July 6, 2022, EMWD's Board of Directors approved entering into an Interagency Financial Contribution Agreement with the City of Murrieta for reimbursement of $3 million for the Los Alamos Hills Water Facilities Project, and the City Council of the City of Murrieta adopted a resolution approving the action on August 16, 2022.

The proposed water infrastructure extension includes a looped water system extending from the adjacent 1508 pressure zone and will be achieved by installation of approximately 6,720 linear feet of 8-inch diameter pipeline, 4,040 linear feet of 12-inch diameter pipeline, and related auxiliary work.

In addition to the installation of the necessary water infrastructure, for properties to connect and receive water service from EMWD, a dual annexation process is required to annex into Metropolitan Water District of Southern California (MWD) and EMWD service areas. The application to annex is done through MWD and the Riverside Local Agency Formation Commission (LAFCO). EMWD will lead, as applicant, the required application processes for annexation and LAFCO approval. It is anticipated that all fees and costs for LAFCO and the dual annexation will be advanced by EMWD with repayment of the annexation fees to be made by property owners along with the associated connection fees.

<u>Financing Program</u>



Best practices for electric vehicle fires

Wear full PPE and SCBA on all vehicle fires. [illegible]

Watch for unexpected hazards. [illegible]

Identify the type of vehicle involved [illegible]

Use a thermal imaging camera to help with the 360 size-up. [illegible]

Establish an appropriate incident command structure. [illegible]

Establish isolated perimeters [illegible]

Stabilize the vehicle. [illegible]

Power down, if possible. [illegible]

Secure a large, continuous and sustainable water supply. [illegible]

Use a large volume of water. [illegible]

Consider that this could be a combined fire, extrication and hazmat incident. [illegible]

Have sufficient fire personnel and apparatus on scene for an extended operation. [illegible]

Share information during transfer. [illegible]

FireRescue1

18/20

Video of multiple air tankers working the Liberty Fire near Murrieta, CA

Bill Gabbert December 7, 2017 Field work

247, BAe-146, C-130, California, DC-10, Liberty Fire, MAFFS

Above: The Liberty Fire east of Murrieta, California, December 7, 2017. Screengrab from the KTLA video.

(Originally published at 7 p.m. PST December 7, 2017)

KTLA shot some excellent stabilized video from a helicopter Thursday of the Liberty Fire that has burned about 300 acres northeast of Murrieta, California. This is a new fire that erupted this afternoon 17 miles north of another new fire, the Lilac Fire south of Temecula which was 3,000 acres at 7 p.m. PST.

https://fireaviation.com/2017/12/07/video-of-multiple-air-tankers-working-the-liberty-fire-near-murrieta-ca/

19/20


20/20

Mitigation, Monitoring, and Reporting Program

The California Environmental Quality Act (CEQA) requires the adoption of feasible mitigation measures to reduce the severity and magnitude of potentially significant environmental impacts associated with project development. In order to ensure that the mitigation measures and project revisions identified in an Environmental Impact Report (EIR) or Mitigated Negative Declaration (MND) are implemented, the Lead Agency is required to adopt a program for monitoring and reporting on the measures it has imposed to mitigate or avoid significant effects (CEQA Guidelines Section 15097[a]). The CEQA Guidelines require that a Mitigation Monitoring and Reporting Program (MMRP) be adopted upon certification of an EIR or adoption of an MND to ensure mitigation measures identified in the EIR or MND are implemented.

According to CEQA Guidelines Section 15097(c), "reporting" generally consists of a written compliance review that is presented to the decision-making body or authorized staff person. A report may be required at various stages during project implementation or upon completion of the mitigation measure. "Monitoring" is generally an ongoing or periodic process of project oversight. This program identifies, at a minimum, the entity responsible for the monitoring, what is to be monitored, how the monitoring shall be accomplished, and the monitoring and reporting schedule.

The MMRP assigns responsibility for monitoring mitigation measures incorporated into the Los Alamos Hills Water System Project (project). Under this program, the Eastern Municipal Water District (District), and the construction contractor under the direction of the District, would be responsible for the implementation and monitoring of these measures before, during, and immediately following construction phases of the project unless otherwise stated herein, in accordance with CEQA Guidelines Section 15097. A record of the MMRP will be maintained at the District office, located at 2270 Trumble Road, Perris, California 92570.

The Initial Study/MND (State Clearinghouse Number 2023010460) analyzed the potential environmental effects of the project and identified measures to mitigate potentially significant impacts associated with construction of the project. The MMRP table presented below documents the mitigation measures to be implemented by the District.

Mitigation, Monitoring, and Reporting Program Incorporated into the Project			
Mitigation Measure	Timing of Verification	Responsible for Verification	Status/ Date/ Initials
Biological Resources			
BIO-1: Coastal California Gnatcatcher Project construction should be conducted outside the coastal California gnatcatcher breeding season, which is March 1 to August 15. If construction must take place during the coastal California gnatcatcher breeding season, a qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(A) Recovery Permit) shall survey Riversidean sage scrub adjacent to the project site for the presence of the coastal California gnatcatcher. Surveys for coastal California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the U.S. Fish and Wildlife Service (USFWS) within the breeding season prior to the commencement of any construction. If the protocol survey concludes that no coastal California gnatcatchers are present or all work is constructed outside of the breeding season (August 16 to February 28), no additional mitigation measures would be necessary. If coastal California gnatcatchers are present, then the following additional mitigation conditions must be met: a. Between March 1 and August 15, no construction activities shall occur within any portion of the project site where construction activities would result in noise levels exceeding 60 A-weighted decibels [dB(A)] hourly average (or ambient, whichever is higher) at the edge of occupied coastal California gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 dB(A) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by District at least two weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; or b. At least two weeks prior to the commencement of construction activities during the breeding season, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dB(A) hourly average (or ambient, whichever is higher) at the edge of habitat occupied by the coastal California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed the noise threshold. If	Prior to Construction and During Construction	District/ Qualified Biologist	

Mitigation, Monitoring, and Reporting Program Incorporated into the Project			
Mitigation Measure	Timing of Verification	Responsible for Verification	Status/ Date/ Initials
the noise attenuation techniques implemented are determined inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16); or c. Prior to construction during the breeding season, the District shall prepare an MSHCP Consistency Analysis for review by the Western Riverside County Regional Conservation Authority and obtain incidental take coverage for coastal California gnatcatcher via the Participating Special Entity process. The proposed project would pay any necessary mitigation fees for impacts to 7.91 acres prior to construction.			
BIO-2: Migratory and Nesting Birds Construction should be conducted outside the nesting season, which is generally defined as January 15 to August 31. If construction must take place during the nesting season, a qualified biologist shall perform a pre-construction survey for nesting birds. The nesting bird survey shall occur no more than seven days prior to the start of construction. Additionally, raptors (birds of prey) are known to begin nest building in January or February. If construction is to occur between January 1 and February 15, a nesting raptor survey will be conducted within the project area, 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 a qualified biologist until a qualified biologist has verified that the young have fledged or the nest has otherwise become inactive.	Prior to Construction and During Construction	District/ Qualified Biologist	
BIO-3: Aquatic Resources The applicant for the proposed project shall avoid indirect impacts to potentially jurisdictional features with best management practices (BMPs), such as the use of silt fences, fiber rolls, and/or gravel bags, implemented. No equipment maintenance or fueling should be performed within or near the non-vegetated channel where petroleum products or other pollutants from the equipment may enter this area.	During Construction	District/ Qualified Biologist	
Geology and Soils			

Mitigation, Monitoring, and Reporting Program Incorporated into the Project			
Mitigation Measure	Timing of Verification	Responsible for Verification	Status/ Date/ Initials
GEO-1: Paleontological Monitor Excavation 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.	During Construction	District/ Qualified Paleontologist	
Noise			
NOI-1: Construction Noise Reduction Measures • District shall require its contractor to implement the following actions relative to construction noise: District shall conduct construction activities between 7:00 a.m. and 8:00 p.m. on weekdays in accordance with the City of Murrieta Municipal Code, Section 16.30.130(A). • Prior to construction, the District in coordination with the construction contractor, shall provide written notification to all properties within 50 feet of the proposed project facilities informing occupants of the type and duration of construction activities. Notification materials shall identify a method to contact the District's program manager with noise concerns. Prior to construction commencement, the District program manager shall establish a noise complaint process to allow for resolution of noise problems. This process shall be clearly described in the notifications. • Stationary noise-generating equipment shall be located as far from sensitive receptors as possible. Such equipment shall also be oriented to minimize noise that would be directed toward sensitive receptors. Whenever possible, other non-noise generating equipment (e.g., roll-off dumpsters) shall be positioned between the noise source and sensitive receptors. • Equipment and staging areas shall be located as far from sensitive receptors as possible. At the staging location, equipment and materials shall be kept as far from adjacent sensitive receptors as possible. • Construction vehicles and equipment shall be maintained in the best possible working order; operated by an experienced, trained operator; and shall utilize the best available noise control techniques	Prior to Construction and During Construction	District/ Construction Contractor	

Mitigation, Monitoring, and Reporting Program Incorporated into the Project			
Mitigation Measure	Timing of Verification	Responsible for Verification	Status/ Date/ Initials
(including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds). • Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would require turning off equipment if it would idle for five or more minutes. • Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible. • The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.			

1.0 Introduction

This Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared in accordance with relevant provisions of the California Environmental Quality Act (CEQA) of 1970, as amended, and the CEQA Guidelines, as revised. This IS/MND evaluates the environmental effects of the proposed Los Alamos Hills Water System Project (proposed project).

The IS/MND includes the following components:

- A Draft MND and the formal findings made by the Eastern Municipal Water District (District or EMWD) that the proposed project would not result in any significant effects on the environment, as identified in the CEQA IS Checklist.

- A detailed project description.

- The CEQA IS Checklist, which provides standards to evaluate the potential for significant environmental impacts from the proposed project and is adapted from Appendix G of the CEQA Guidelines. The proposed project is evaluated in 21 environmental issue categories to determine whether the proposed project's environmental impacts may be significant in any category. Brief discussions are provided that further substantiate the proposed project's anticipated environmental impacts in each category.

Because the proposed project fits into the definition of a "project" under Public Resources Code Section 21065 requiring discretionary approvals by the District, and because it could result in a significant effect on the environment, the proposed project is subject to CEQA review. The IS Checklist was prepared to determine the appropriate environmental document to satisfy CEQA requirements: an Environmental Impact Report (EIR), a Mitigated Negative Declaration (MND), or a Negative Declaration (ND). The analysis in this IS Checklist supports the conclusion that the proposed project may result in significant environmental impacts, but (1) revisions in the project plans or proposals made by or agreed to by the applicant before a proposed MND and IS are released for public review would avoid the effects or mitigate the effects to appoint where clearly no significant effects would occur, and (2) there is no substantial evidence, in light of the whole record before the District, that the proposed project as revised may have a significant effect on the environment; therefore, an MND has been prepared.

This IS/MND will be circulated for 30 days for public and agency review, during which time individuals and agencies may submit comments on the adequacy of the environmental review. Following the public review period, the District's Board will consider any comments received on the IS/MND when deciding whether to adopt the MND.

2.0 Project Description

1. Project Name:

Los Alamos Hills Water System Project ("proposed project")

2. Lead Agency:

Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92570

3. Contact Person and Phone Number:

Joseph Broadhead
Principal Water Resource Specialist – CEQA/NEPA
Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572-8300
(951) 928-3777
broadhej@emwd.org

4. Project Location:

The proposed project is located in the city of Murrieta, California. The project area encompasses approximately 171 acres and is located near Los Alamos Road (Figures 1, 2, and 3). There are 50 rural residential parcels within the project area and 45 of those lots are developed with a residential structure. Los Alamos Road, Mason Avenue, Mary Place, and Celia Road connect back into the existing pipeline along Ruth Ellen Way and Los Alamos Road.

5. Project Applicant/Sponsor:

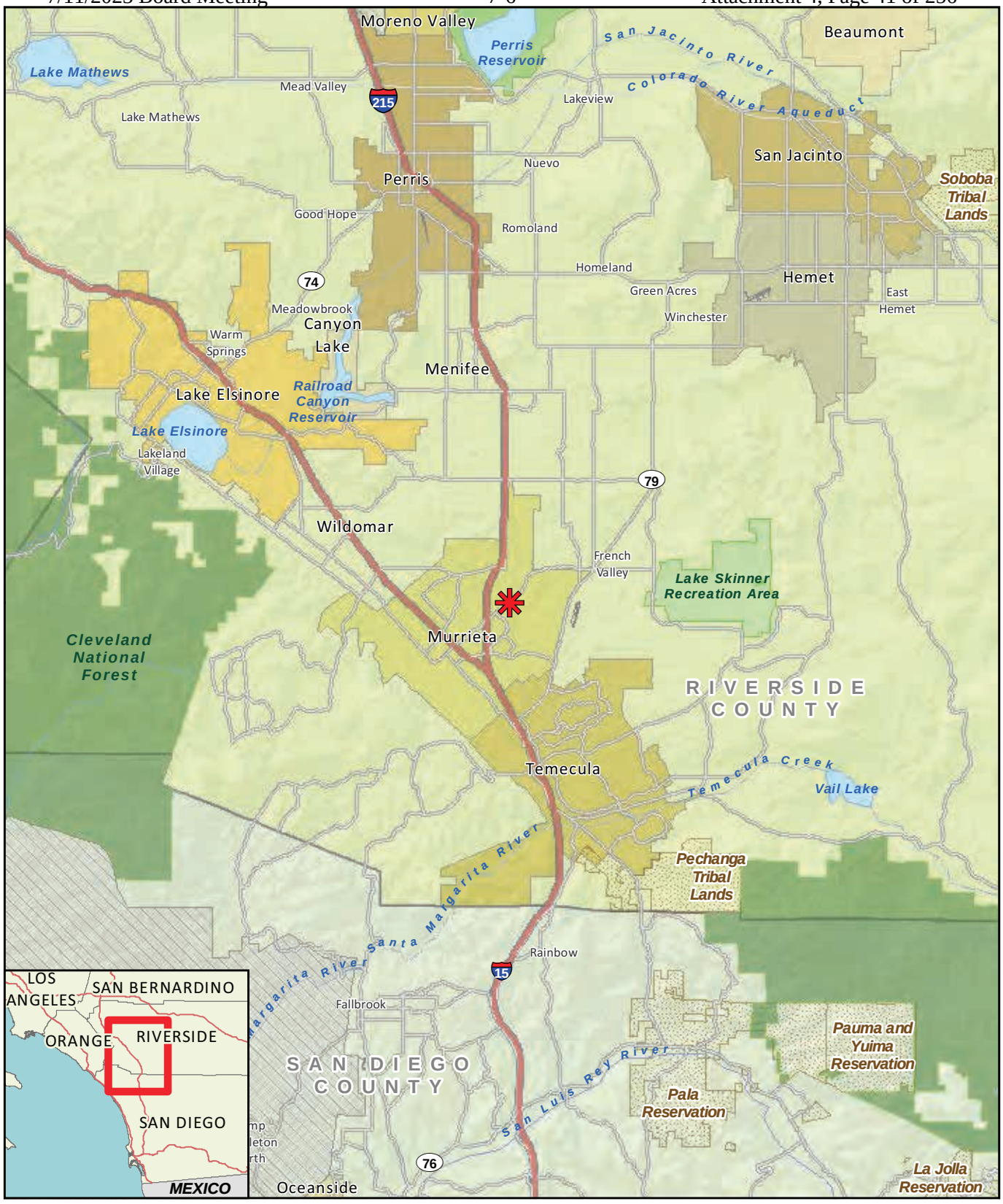
Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572-8300

6. General Plan Designation:

The project area is designated as Large Lot Residential in the City of Murrieta (City) General Plan (General Plan). The area surrounding the proposed project is also designated as Large Lot Residential in the General Plan.

7. Zoning:

The project area and surroundings are zoned as Rural Residential (RR).



Project Location

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FIGURE 1
Regional Location

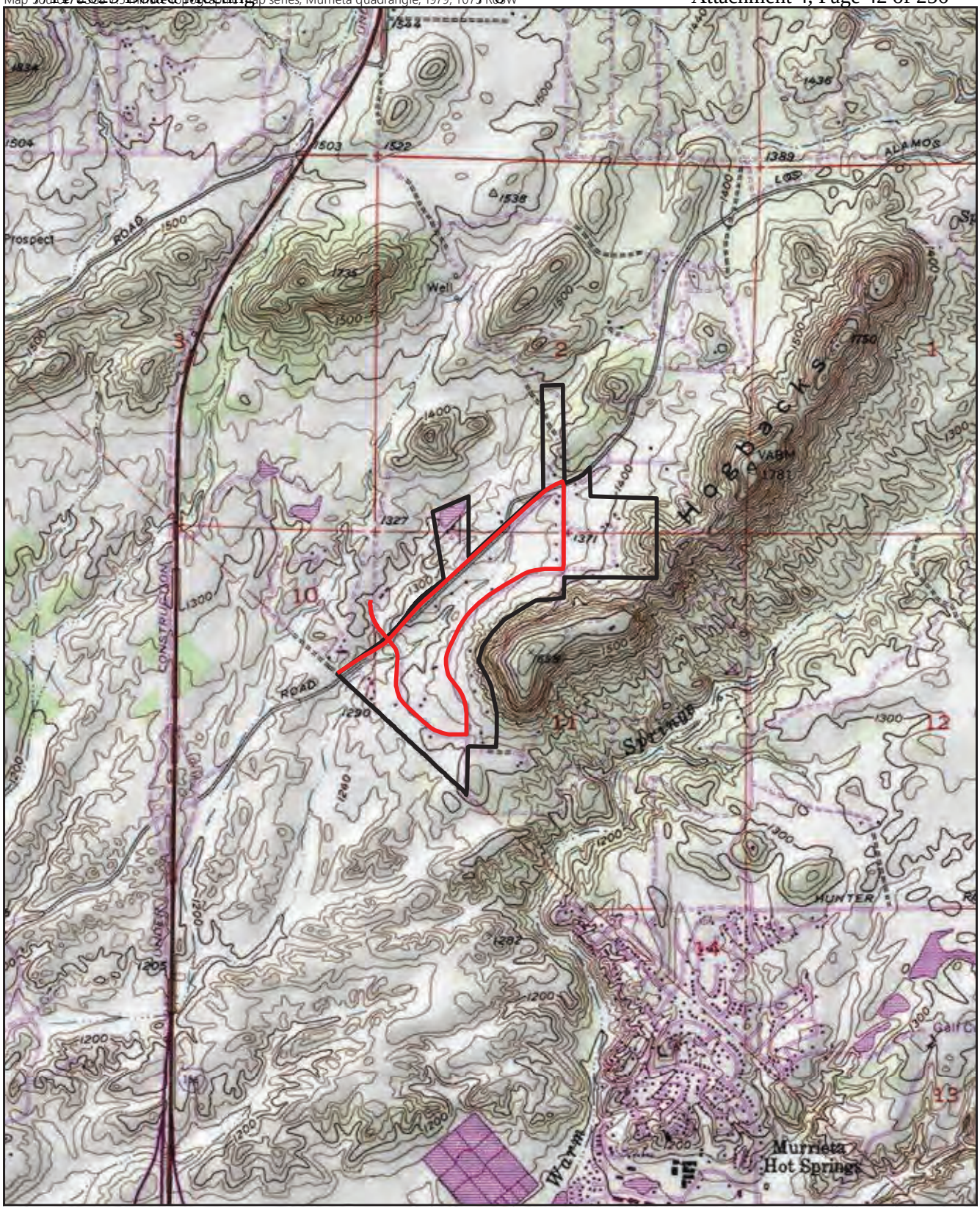

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FIGURE 2
Project Site on USGS Map

FIGURE 3
Pipeline Location on Aerial Photograph

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8. Project Background

The project area, as shown in Figure 4, is outside both the Eastern Municipal Water District (District) and the Metropolitan Water District of Southern California (MWD) service areas. Properties in this area currently rely on private wells for potable water. The project area is within the MWD's sphere of influence and is proposed to be annexed into both the District's service area and MWD's service area to receive potable water.

The project area is currently a subset of the "Keyhole Area", an approximately 1,000-acre area located outside District and MWD service areas (see Figure 4). The adjacent 96th Fringe Annexation properties have been annexed, water pipelines connected, and are now eligible for water service.

9. Proposed Project Description:

The proposed project consists of the annexation of properties within the community known as Los Alamos Hills within the city of Murrieta, and the construction of 10,685+/- linear feet of water pipeline to service the annexed properties. Los Alamos Hills includes approximately 50 properties (171.9 acres) fronting Los Alamos Road, Celia Road, Mary Place, and Mason Avenue. The area considered for annexation is referred to in this document as the "project area" (see Figure 4). Forty-five of the 50 parcels in the project area are currently developed with residential structures. Currently, owners of 36 of the 50 properties have opted to annex to the District (Figure 5).

A dual-annexation process is required to annex properties into MWD and EMWD service areas. The application to annex is done through MWD and the Riverside Local Agency Formation Commission (LAFCO). EMWD will serve as the applicant for the annexation processes into MWD and EMWD services areas, as well as the LAFCO process. It is anticipated that all fees and costs for LAFCO, the dual-annexation processes and connection fees would be advanced by EMWD with repayment of the annexation costs and connection fees to be made by residents of Los Alamos Hills that opt to proceed with annexation. District water service to the project area would be allowed once annexation is approved by the District, MWD, and LAFCO.

The "project site" is that portion of the project area where impacts could occur due to pipeline construction. The project site consists of those portions of Los Alamos Road, Celia Road, Mason Road, Mary Place, and Ruth Ellen Way within the project area. The project site is located entirely within city roadway rights-of-way, a portion of which is paved and a portion unpaved.

As shown in Figure 6, project site plan, the following are the proposed pipeline segments and sizing:

- Los Alamos Road: 12-inch pipeline, from Celia Road to Mason Avenue (approximately 3,350 linear feet)
- Celia Road: 8-inch pipeline, Mary Place to Mason Road (approximately 2,000 linear feet)
- Mason Road: 8-inch pipeline, Mary Place to Los Alamos Road (approximately 1,260 linear feet)
- Mary Place: 8-inch pipeline, Celia Road to Mason Avenue (approximately 3,400 linear feet)
- Ruth Ellen Way: 12-inch pipeline, Los Alamos Road to the northern property line of Rail Ranch Elementary School (approximately 675 linear feet)

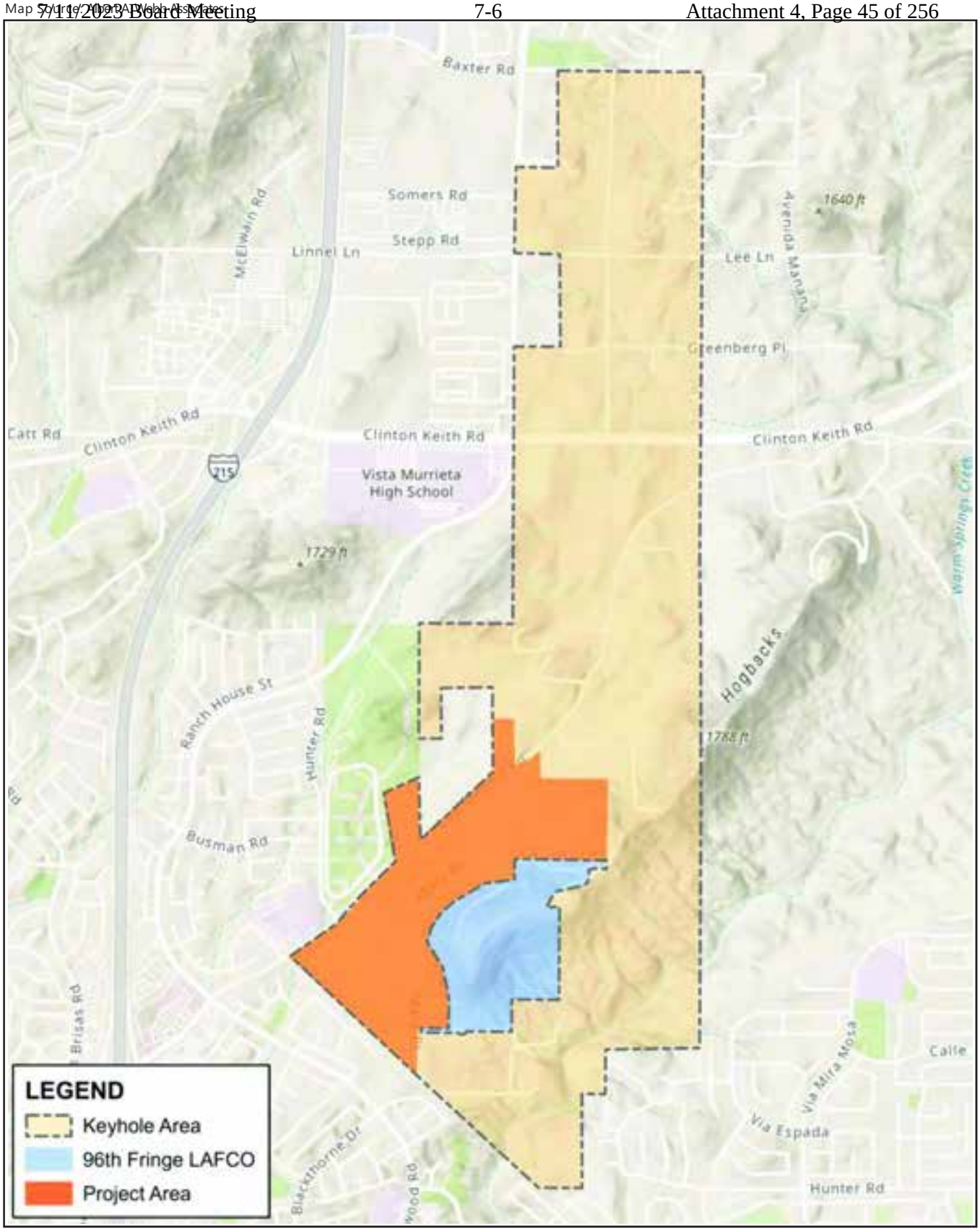

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FIGURE 4
Project Area

FIGURE 5
Current Los Alamos Hills Parcel Annexations

Source: EMWD

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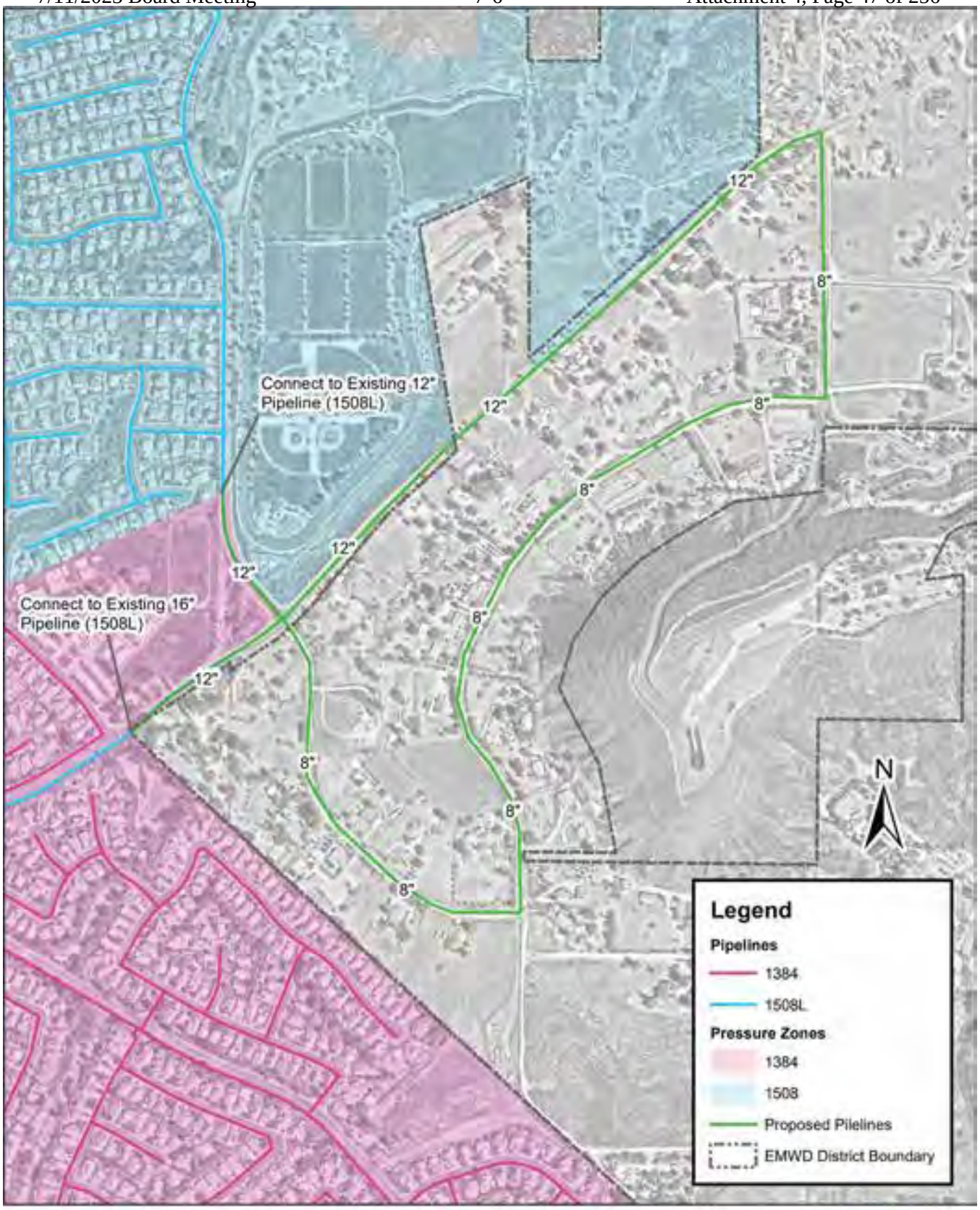

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FIGURE 6
Proposed Pipelines

The proposed pipeline alignment is designed to avoid conflict with existing utilities and existing culverts beneath the roadways. Construction of the proposed pipeline involves open trench excavation estimated at 4 feet wide and 6 feet deep. The trench cross-sections are presented in Figures 7 and 8. Up to 200 linear feet of pipeline could be constructed each day. Construction of trenches would be in the roadway above any drainage culverts. If there is not enough depth from pavement to install the pipelines above the drainage culverts, construction of the pipeline would require a tunnel beneath the culverts. Total estimated volume of material to be excavated is approximately 20,031 cubic yards, which may be reused onsite as trench backfill; however, this would not be determined until excavation begins. Therefore, it is conservatively assumed that all of the material would be hauled offsite for disposal. Total construction time is conservatively estimated to be approximately 5 months, with construction occurring between the hours of 7:00 a.m. to 8:00 p.m. No night construction would occur.

Construction of the pipeline is anticipated to require use of the construction equipment shown in Table 1.

Table 1
Estimated Construction Equipment

Equipment	Number Required for Pipeline
Air Compressor	2
Concrete Industrial Saw	1
Excavator	1
Generator Set	2
Off-Highway Truck	1
Signal Boards	4
Sweeper/Scrubber	1
Tractors/Loaders/Backhoes	2
Pavers	1

After construction is complete, all pipeline construction areas would be restored to pre-construction conditions (i.e., no permanent disturbance footprint). The width of resurfacing would be up to the nearest lane line or gutter in accordance with the City's requirements. Unpaved and paved roads would be replaced to original conditions.

The project would also include lateral connections, water meters, back flow devices and fire hydrants. Water service laterals and meters would be installed to parcels opting into annexation following annexation and pipeline construction. Private service lateral easements would be required for lots in the project area not fronting on the project site roadways.

Fire hydrants would be provided per EMWD Std Dwg B-362. Since there are essentially no curb and gutters within the project area, fire hydrants would be installed with two bollards and a small concrete pad. Fire hydrants would be located at property lines and at low points in lieu of a blow off, where possible. Typically, for new residential development, fire hydrant spacing is determined by the fire authority with jurisdiction for the review and is included in the conditions of approval for the development. For example, Riverside County Ordinance 787.2 indicates that fire hydrants are to be located near street intersections and the minimum fire hydrant spacing is to be 350 feet for new development. National Fire Protection Association Standard 24 has similar requirements for new development. Since there is no new development to be approved in conjunction with this project, coordination with the City of Murrieta and the associated fire authority would be required to determine fire hydrant spacing and locations. A 350-foot minimum spacing should be anticipated.

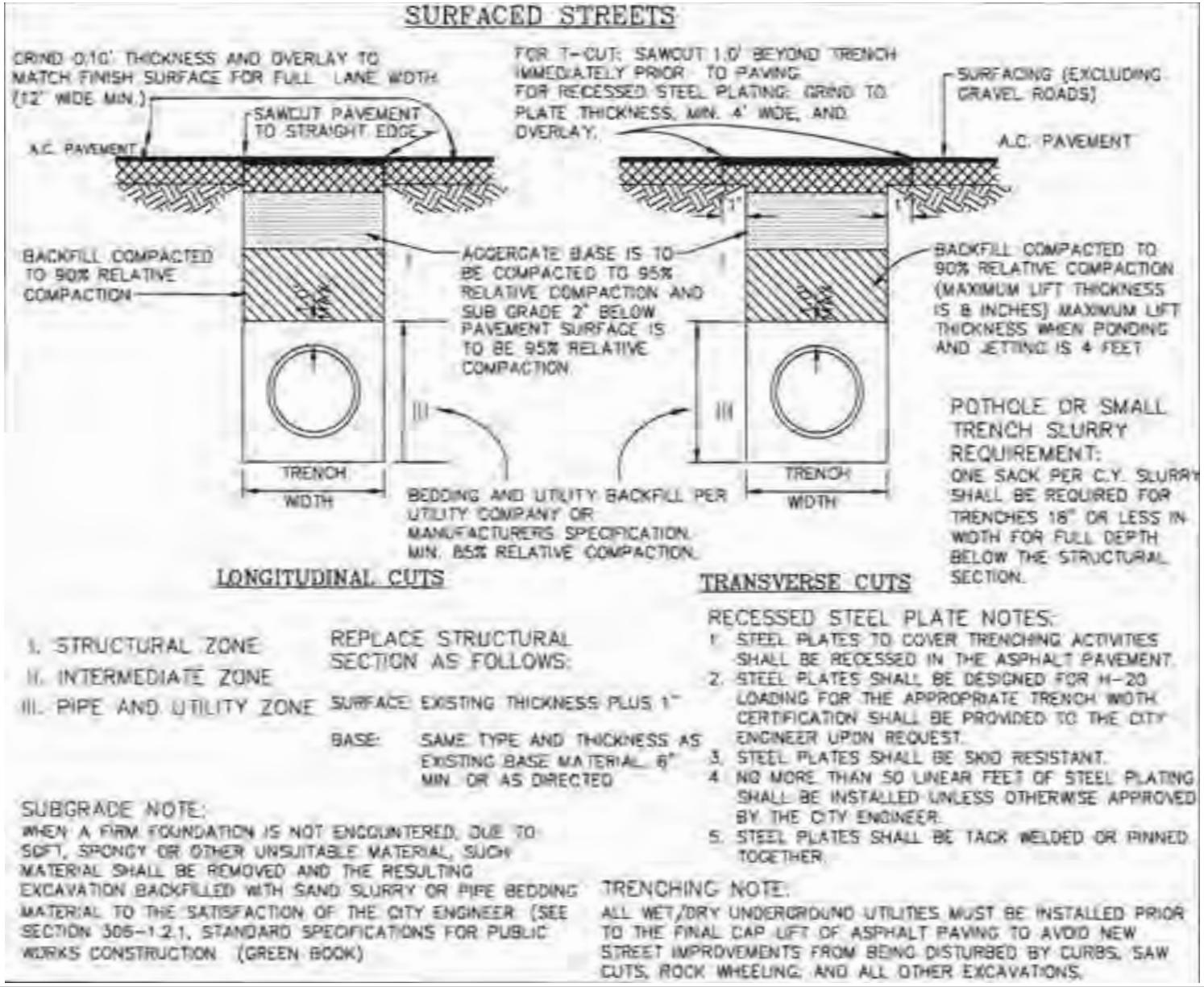

FIGURE 7
Utility Trench Backfill and Surfaced Street Restoration

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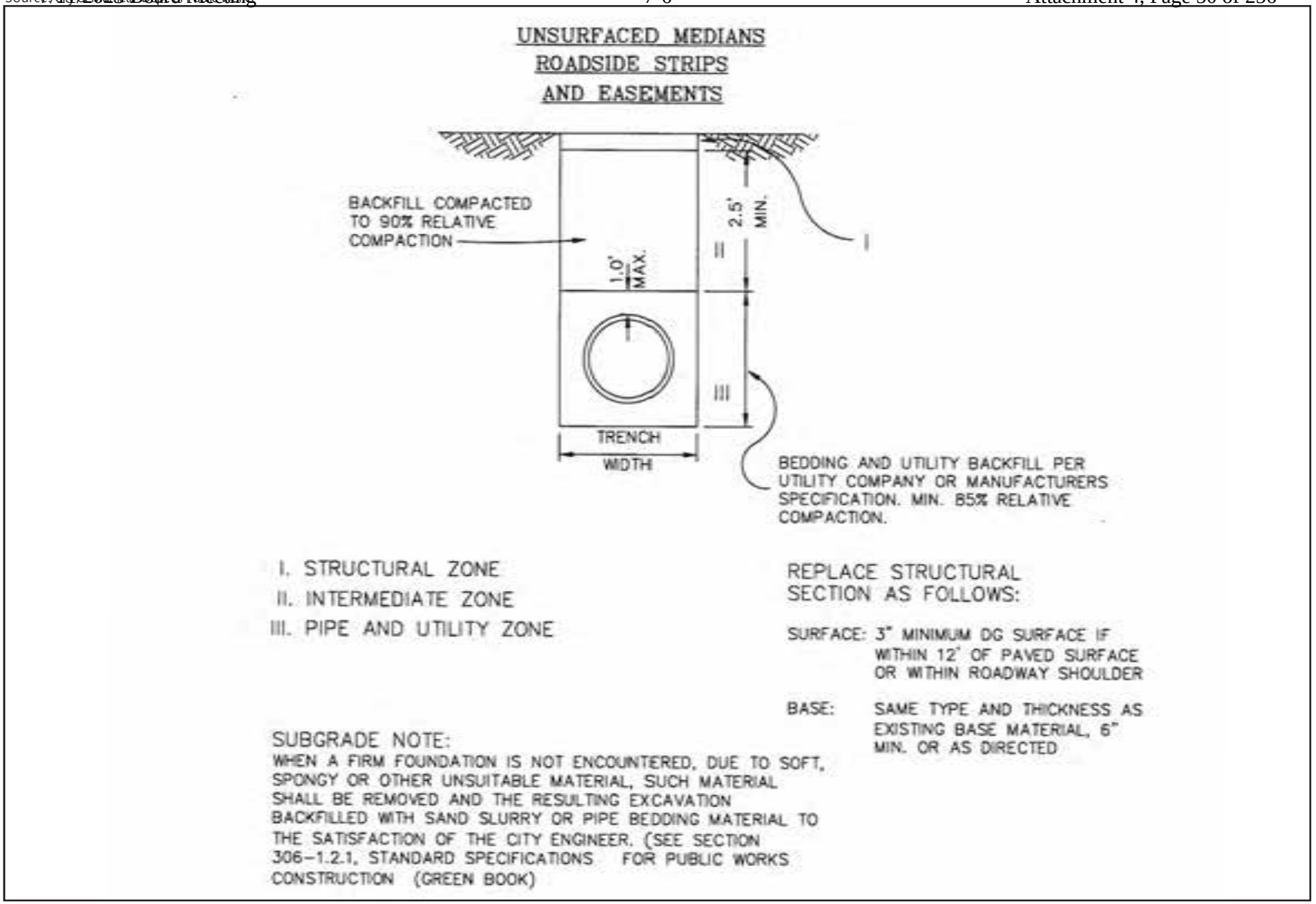

FIGURE 8
Utility Trench Backfill and Unsurfaced Median/Roadside Strip/Easement Restoration

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10. Surrounding Land Use(s) and Project Setting:

The project site is located within city roadway rights-of-way and consists of those portions of Los Alamos Road, Celia Road, Mason Road, Mary Place, and Ruth Ellen Way within the project area. The northern portion of the project site along Ruth Ellen Way proposes to connect to an existing 12-inch water pipeline and the point of connection is located next to the Los Alamos Hills Sports Park to the east, the Rail Ranch School, as well as an existing tract residential development to the west. There are three parcels that are included in the project site that are located north of Los Alamos Road (see Figure 3). The majority of the area to the east and south of the project site consists of single-family residential rural development with scattered undeveloped lots (Photographs 1 through 4).

The project site is located approximately 1.2 miles east of I-215. The project site is in the U.S. Geological Survey (USGS) Murrieta quadrangle, Township 7 South, Range 3 West (USGS 1979; see Figure 2).

The proposed project is located within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) plan area (County of Riverside 2003). No components of the proposed project are within or adjacent to any existing or proposed criteria areas or reserves defined in the MSHCP.

11. Required Approvals:

District adoption of this MND, and approval of the annexation/pipeline project.

12. Other Required Agency Approvals or Permits Required:

- LAFCO approval of District annexation
- MWD approval of District annexation
- Encroachment Permit from the City of Murrieta
- Notice of Intent/Storm Water Pollution Prevention Plan (NOI/SWPPP) from Regional Water Quality Control Board for construction of a linear pipeline

13. 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.?

On October 7, 2022, the District sent consultation notification letters to Native American tribes on the District's Master List pursuant to the requirements of Assembly Bill 52 (AB 52) pertaining to government-to-government consultation regarding the project. Six Native American tribes were contacted but to date none have responded to consultation requests.

PHOTOGRAPH 1
Overview of Ruth Ellen Way, Looking North from
Los Alamos Road Intersection

PHOTOGRAPH 2
Overview of Los Alamos Road, Looking Northeast from Eastern Boundary of
Los Alamos Hills Sports Park Equestrian Trail

PHOTOGRAPH 3
End of Pavement at the Intersection of Mason Avenue and Mary Place, Looking West from East Side of Mason Avenue where it Transitions to Los Alamos Heights Road

PHOTOGRAPH 4
Overview of Celia Road with Drainage Ditch, Looking South from Celia Road, Approximately 500 feet South of Intersection with Los Alamos Road

14. Summary of Environmental Factors Potentially Affected:

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

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☒ Biological Resources	☐ Cultural Resources	☐ Energy
☒ Geology/Soils	☐ Greenhouse Gas Emissions	☐ Hazards & 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

3.0 Draft Mitigated Negative Declaration

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION shall be prepared.

☒ I find that, although the proposed project might have a significant effect on the environment, there would not be a significant effect in this case because revisions in the project have been made, or agreed to, by the project proponent. A MITIGATED NEGATIVE DECLARATION shall be prepared.

☐ I find that the proposed project might have a significant effect on the environment and/or deficiencies exist relative to the City's General Plan Quality of Life Standards, and the extent of the deficiency exceeds the levels identified in the City's Environmental Quality Regulations pursuant to Zoning Code Article 47, Section 33-924 (b), and an ENVIRONMENTAL IMPACT REPORT shall be required.

☐ I find that the proposed project might have a "potentially significant impact" or "potentially significant unless mitigated impact" on the environment, but at least one effect: (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT shall be required, but it shall analyze only the effects that remain to be addressed.

☐ I find that, although the proposed project might have a significant effect on the environment, no further documentation is necessary 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.

Joe Broadhead
Signature

1/24/23
Date

Joe Broadhead
Printed Name

Principal Water Resources Specialist
Title

4.0 Initial Study Checklist

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved. A "No Impact answer should be explained where it is based on project specific factors as well as general standards.
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant 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.
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or (mitigated) negative declaration. Section 15063(c)(3)(D).
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:

    a. The significance criteria or threshold, if any, used to evaluate each question; and
    b. The mitigation measure identified, if any, to reduce the impact to less than significant.

4.1 Aesthetics

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 non-urbanized 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 a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

Construction of the water pipeline within the project site could temporarily alter the scenic composition of the project area with the addition of construction vehicles and equipment being used. The project site/pipeline alignment is comprised of both paved and unpaved ground, either bare or with existing disturbed vegetation. Recreational uses and vacant lands are located to the north of the project area, residential development surrounds the east, south, and west of the project

area. Given that Murrieta is surrounded by rolling hillsides and steep mountain slopes, distant vistas of surrounding significant visual features are afforded from within the City. Distant vistas to the north and east can be viewed from the project area. Construction activities along the pipeline alignment would include grubbing/land clear phase, soil hauling, excavation/trenching, staging areas, utility placement, back fill and paving, which could temporarily change the scenic composition of the project area; however, the distant scenic vistas would not be affected. Upon completion of construction, all proposed improvements would be located underground within existing paved and unpaved streets and would not be visible. Therefore, pipeline construction would not have a substantial adverse effect on a scenic vista. Impacts would be less than significant.

b. No Impact

There are no designated State Scenic Highways within the City; therefore, the project area is not visible from a State Scenic Highway. The closest officially designated scenic highway to the project area is State Route 74. The official designation for State Route 74 begins at the west boundary of the San Bernardino National Forest and State Route 111 and ends at Palm Desert, which is approximately 26 miles east of the project area (California Department of Transportation [Caltrans] 2022). Therefore, the proposed project would not substantially damage any scenic resources within a state scenic highway. No impact would occur.

c. Less Than Significant Impact

The project area is characterized by rural residential development with recreational uses and undeveloped lands located to the north of the project area. Construction activities associated with the pipeline portion of the proposed project (e.g., presence of construction vehicles, excavated materials, laydown areas) would create short-term visual effects for the surrounding residential areas. All construction-related visual impacts would be removed following construction. Project implementation would not adversely affect the quality of public views of the project area and its surroundings and impacts would be less than significant.

d. Less Than Significant Impact

Construction of the water pipeline would be limited to daytime hours Monday through Friday and is not anticipated to require lighting. In the event that construction lighting is required, it would be properly shielded and pointed downwards to avoid spillover effects onto neighboring properties, consistent with Murrieta Municipal Code (MMC) Section 16.18.100(C). Once project construction is complete, any temporary lighting that was required would be removed. Furthermore, the water pipeline loop would be located underground and would not include any permanent aboveground components. Therefore, the proposed project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area, and impacts would be less than significant.

4.2 Agriculture and Forestry Resources

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless 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 Section 1220[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?	☐	☐	☐	☒

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not directly result in development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. No Impact

The project site is not located on land classified as "Farmland of Local Importance" by the Farmland Mapping and Monitoring Program (California Department of Conservation 2018). Furthermore, the proposed loop water pipeline would be installed within existing roads that would have no potential for conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. No impact would occur.

b. No Impact

Physical changes resulting from the proposed project include the construction of a pipeline loop below ground within existing road ROWs. Neither the project site nor surrounding properties are zoned for agricultural uses, nor are they subject to a Williamson Act contract. No impact would occur.

c. No Impact

The project site does not contain any forest or timberland as defined by Public Resources Code Section 12220[g], Public Resources Code Section 4526, or Government Code Section 51104(g) and is not zoned as forest or timberland. No impact would occur.

d. No Impact

The project site does not contain any forest or timberland as defined by Public Resources Code Section 12220[g], Public Resources Code Section 4526, or Government Code Section 51104(g). No impact would occur.

e. No Impact

There are no agricultural uses or forestlands in the vicinity of the project site. Therefore, the proposed project would not result in conversion of farmland or forest land. No impact would occur.

4.3 Air Quality

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 an 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?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not directly result in development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

The proposed project is located within the South Coast Air Basin (Basin) under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Air districts are tasked with regulating emissions to ensure that air quality in the Basin does not exceed National or California Ambient Air Quality Standards (NAAQS and CAAQS). NAAQS and CAAQS represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. NAAQS and CAAQS have been established for six common pollutants of concern known as criteria pollutants, which include ozone, carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead (Pb), and respirable particulate matter (PM_{10} and $PM_{2.5}$).

The Basin is currently classified as a federal non-attainment area for ozone and $PM_{2.5}$ and a state non-attainment area for ozone, PM_{10}, and $PM_{2.5}$. The regional air quality plan, the 2016 Air Quality Management Plan (AQMP), outlines measures to reduce emissions of ozone and $PM_{2.5}$. Whereas reducing PM concentrations is achieved by reducing emissions of $PM_{2.5}$ to the atmosphere, reducing ozone concentrations is achieved by reducing the precursors of photochemical formation of ozone, volatile organic compounds (VOC), and oxides of nitrogen (NO_X).

Growth forecasting for the AQMP is based in part on the land uses established by local general plans. Thus, if a project is consistent with land use as designated in the local general plan, it can normally be considered consistent with the AQMP. Projects that propose a different land use than is identified in the local general plan may also be considered consistent with the AQMP if the proposed land use is less intensive than buildout under the current designation. For projects that propose a land use that is more intensive than the current designation, analysis that is more detailed is required to assess conformance with the AQMP.

The project area and surroundings are designated as Civic/Institutional, Specific Plan, and Rural Residential in the Murrieta General Plan 2035 and are zoned as Civic/Institutional (C/I) (Parks and Recreation (PR), Open Space (OS), and Rural Residential (RR). The proposed project would be consistent with land use designations, as it would supply water for existing residential uses. As described in Section 4.3b below, pipeline construction and operation (inspection and maintenance trips) would not result in significant air quality impacts. The proposed project does not include growth-generating components, but rather would provide water service to existing and planned development. As such, the proposed project would be consistent with growth projections contained in the Murrieta General Plan 2035 and AQMP forecasts. Based on these considerations and pursuant to SCAQMD guidelines, project-related emissions are accounted for in the AQMP. Therefore, the proposed project would not conflict with or obstruct implementation of the applicable air quality plan, and impacts would be less than significant.

b. Less Than Significant Impact

Regional Significance Thresholds

NAAQS and CAAQS have been established for six criteria pollutants (ozone, CO, SO_2, NO_2, lead, and PM). As described in Section 4.3a above, the SCAQMD is the air pollution control agency responsible for protecting the people and the environment of the Basin from the effects of air pollution. Accordingly, the District evaluates project air quality emissions based on the quantitative emission thresholds originally established in the SCAQMD's CEQA Air Quality Handbook (SCAQMD 1993). SCAQMD's daily significance thresholds for impacts to regional air quality are shown in Table 2.

Table 2 SCAQMD Air Quality Significance Thresholds – Mass Daily Thresholds		
Pollutant	Emissions (pounds)	
	Construction	Operational
Oxides of Nitrogen (NO_X)	100	55
Volatile Organic Compounds (VOC)	75	55
Coarse Particulate Matter (PM_{10})	150	150
Fine Particulate Matter ($PM_{2.5}$)	55	55
Oxides of Sulfur (SO_X)	150	150
Carbon Monoxide (CO)	550	550
Lead (Pb)	3	3
SOURCE: SCAQMD Air Quality Significance Thresholds (SCAQMD 2015).		

Emissions that would result from construction of the water pipeline component of the proposed project would be subject to the rules and regulations of SCAQMD. The SCAQMD rules applicable to the proposed project may include the following:

- **Rule 401, Visible Emissions.** This rule establishes the limit for visible emissions from stationary sources.

- **Rule 402, Nuisance.** This rule prohibits the discharge of air pollutants from a facility that cause injury, detriment, nuisance, or annoyance to the public or damage to business or property.

- **Rule 403, Fugitive Dust.** This rule requires fugitive dust sources to implement best available control measures for all sources and prohibits all forms of visible particulate matter from crossing any property line. SCAQMD Rule 403 is intended to reduce PM_{10} emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust.

- **Rule 431.2, Sulfur Content of Liquid Fuels.** The purpose of this rule is to limit the sulfur content in diesel and other liquid fuels for the purpose of reducing the formation of oxides of sulfur (SO_X) and particulates during combustion and of enabling the use of add-on control devices for diesel-fueled internal combustion engines. The rule applies to all refiners, importers, and other fuel suppliers such as distributors, marketers, and retailers, as well as to users of diesel, low-sulfur diesel, and other liquid fuels for stationary-source applications in the SCAQMD. The rule also affects diesel fuel supplied for mobile sources.

- **Rule 1110.2, Emissions from Gaseous- and Liquid-Fueled Engines.** This rule applies to stationary and portable engines rated at greater than 50 horsepower. The purpose of Rule 1110.2 is to reduce NO_X, VOC, and CO emissions from engines. Emergency engines, including those powering standby generators, are generally exempt from the emissions and monitoring requirements of this rule because they have permit conditions that limit operation to 200 hours or less per year as determined by an elapsed operating time meter.

- **Rule 1113, Architectural Coatings.** This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

Pipeline construction would result in short-term emissions associated with construction. Operation of the pipeline would result in emissions related to minor vehicle/equipment use associated with routine inspection and maintenance; however, these operational emissions would be negligible. Therefore, this analysis focuses on emissions associated with construction activities. Construction emissions associated with pipeline construction were modeled using the Sacramento Metropolitan Air Quality Management District's (SMAQMD) Roadway Construction Emissions Model (RCEM) Version 9.0.1 (SMAQMD 2022). The RCEM is a spreadsheet-based model that is able to use basic project information (e.g., total construction months, project type, total project area) to estimate a construction schedule and quantify exhaust emissions from heavy-duty construction equipment, haul trucks, and worker commute trips associated with linear construction projects. Version 9.0.1 of the model incorporates the most currently approved 2017 Emission Factor (EMFAC2017)[1] model and Off-Road emissions factors model. Although RCEM was developed by SMAQMD, it is appropriate for use in the SCAQMD jurisdiction because it is applicable for all statewide construction projects that involve construction equipment that is subject to California Air Resources Board (CARB) construction equipment emissions standards and incorporates statewide emission factor models (EMFAC2017 and Off-Road). RCEM calculates fugitive dust, exhaust, and off-gas emissions from grubbing/land clearing, grading/excavation, drainage/utilities/sub-grade, and paving activities associated with construction projects that are linear in nature (e.g., road or levee construction, pipeline installation, transmission lines). Construction is expected to begin in the fall of 2023 and last approximately five months.

The pipeline alignment would consist of a total of approximately 10,685 linear feet. The total project site along the pipeline alignment was calculated assuming a conservative trench width of 5 feet and a depth of 10 feet. Excavated soil would likely be replaced in the trench once the new pipeline is replaced; however, to be conservative, hauling was included in the analysis. Hauling emissions associated with asphalt removal were calculated assuming a total of 244 cubic yards of asphalt export (5,275 feet of paved road, 5 feet wide, and 3 inches deep). Hauling emissions associated with soil removal were calculated assuming all the excavated soil would be hauled, for a total of 19,787 cubic yards of soil export (10,685 feet long, 5 feet wide, and 10 feet deep). Asphalt hauling was modeled over the duration of the 0.25-month grubbing/land clear phase, and soil hauling was modeled over the duration of the 2.25-month grading/excavation phase. Modeled construction equipment includes a backhoe, loader, excavator, sweeper, paver, two generators, air compressor, concrete saw,

[1]The 2021 Emission Factor (EMFAC2021) model was released in January 2021; however, EMFAC2021 has not yet been approved for use by the U.S. Environmental Protection Agency (U.S EPA). EMFAC2017 is the most recent version of the model approved by the U.S. EPA, and was therefore used in this analysis. Use of EMFAC2021 would not result in emissions that are substantially different than those calculated in this analysis, particularly since the main source of emissions would be construction equipment which are calculated using the Off-Road emissions factor model methodologies incorporated into RCEM.

water truck, and signal boards along with dump trucks used for hauling, utility trucks, and employee vehicles. Construction would require up to 10 workers per day.

The maximum daily construction emissions are summarized in Table 3. Appendix A contains the RCEM calculations for this pipeline project. Appendix A also contains detailed calculations showing how the project size and hauling quantities were calculated.

Table 3
Maximum Daily Construction Emissions
(pounds per day)

	Pollutant					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Grubbing/Land Clearing	2.93	23.83	31.00	0.06	3.35	1.54
Grading/Excavation	2.96	27.35	31.45	0.08	3.47	1.60
Drainage/Utilities/Sub-Grade	2.93	23.21	30.92	0.06	3.33	1.53
Paving	0.48	3.40	5.01	0.01	0.19	0.15
Maximum Daily Emissions	**2.96**	**27.35**	**31.45**	**0.08**	**3.47**	**1.60**
SCAQMD Threshold	*75*	*100*	*550*	*150*	*150*	*55*
Significant Impact?	No	No	No	No	No	No

ROG = reactive organic gases; NO_X = nitrogen oxides; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than 10 microns; $PM_{2.5}$ = particulate matter less than 2.5 microns

Construction emissions were compared to the significance thresholds shown in Table 2 to assess the significance of the air quality emissions resulting from pipeline construction. These thresholds are designed to provide limits below which project emissions would not significantly change regional air quality.

As shown in Table 3, maximum daily construction emissions associated with the pipeline construction are projected to be less than the applicable thresholds for all criteria pollutants, including emissions for ozone precursors (reactive organic compounds [ROG] and NO_X), PM_{10}, and $PM_{2.5}$. Therefore, pipeline construction would not result in a cumulatively considerable net increase in emissions of ozone, PM_{10}, or $PM_{2.5}$, and impacts would be less than significant.

After installation of the underground pipeline, there would be occasional inspection and maintenance trips. These trips would be minimal and currently occur within the District's jurisdiction by existing staff. Inspection and maintenance trips would not result in operational emissions that exceed SCAQMD thresholds and there would be no other source of operational emissions. Impacts associated with pipeline operation would be less than significant.

Localized Construction Impacts

In addition to these regional significance thresholds, the SCAQMD utilizes Localized Significance Thresholds (LST) to evaluate localized air quality impact to sensitive receptors in the vicinity of the proposed project (SCAQMD 2008). 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 at the nearest residence or sensitive receptor. Localized air quality impacts would occur if pollutant concentrations at sensitive receptors exceeded applicable NAAQS or CAAQS.

The project area is located within Source Receptor Area 26. LSTs apply to on-site air emissions of CO, NO_2, PM_{10}, and $PM_{2.5}$. The LST methodology states that only on-site emissions should be compared to LSTs. Therefore, off-site emissions associated with worker travel, materials deliveries, and other mobiles sources are not evaluated against LSTs. The LSTs for a 1-acre site with receptors at 25 meters were conservatively used. The results of the LST analysis are provided in Table 4.

Table 4
Localized Construction Emissions

	Pollutant			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emission	27.35	31.45	3.47	1.60
LST Threshold	*162*	*750*	*4*	*3*
Threshold Exceeded?	No	No	No	No

As shown in Table 4, maximum localized pipeline construction emissions would not exceed any of the SCAQMD recommended localized screening thresholds. Therefore, the pipeline construction of the proposed project would not exceed the LST thresholds for CO, NO_X, PM_{10}, or $PM_{2.5}$, and impacts would be less than significant.

c. Less Than Significant Impact

A sensitive receptor is a person in the population who is more susceptible to health effects due to exposure to an air contaminant than is the population at large. Examples of sensitive receptor locations in the community include residences, schools, playgrounds, childcare centers, churches, athletic facilities, retirement homes, and long-term health care facilities. Residential uses are located adjacent to the pipeline loop. Additionally, a park is located north of the pipeline loop. Pollutants that have the potential to affect sensitive receptors include criteria pollutants, diesel particulate matter (DPM), and CO hotspots. Ozone is formed through the combination of ROG and NO_X, with help from sunlight and heat. Exposure to either can impact respiratory health, causing respiratory inflammation and asthma exacerbations. Health effects of DPM are wide ranging, with strong links to all-cause mortality, cardiovascular mortality and hospitalizations, and respiratory and asthma hospitalizations. Adverse health effects associated with CO include chest pain in heart patients, headaches, and reduced mental alertness. Impacts to sensitive receptors from criteria pollutants are discussed above in Section 4.3b, Localized Construction Impacts. DPM and CO hotspots are discussed below.

Diesel Particulate Matter

Construction of the pipeline would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Construction of the pipeline would result in the generation of diesel exhaust DPM emissions from the use of off-road diesel equipment required for construction activities and on-road diesel equipment used to bring materials to and from the project site.

Generation of DPM from construction projects typically occurs in a single area for a short period. Construction is anticipated to last for approximately five months. The dose to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has with the substance. Dose is positively correlated with time, meaning that a longer

exposure period would result in a higher exposure level for the Maximally Exposed Individual. The risks estimated for a Maximally Exposed Individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed project (OEHHA 2015). Although the alignment is located adjacent to residential uses, construction equipment would only be located adjacent to a particular sensitive receptor for a matter of days or weeks since work would move along the alignment. Thus, because the duration of proposed construction activities near any specific sensitive receptor would be minimal and would be significantly less than the 30-year exposure period used in health risk assessments, the impacts would be less than significant.

Additionally, with ongoing implementation of U.S. EPA and CARB requirements for cleaner fuels; off-road diesel engine retrofits; and new, low-emission diesel engine types, the DPM emissions of individual equipment would be reduced over time. As discussed previously, all construction equipment is subject to the CARB In-Use Off-Road Diesel-Fueled Fleets Regulation, which limits unnecessary idling to 5 minutes, requires all construction fleets to be labeled and reported to CARB, bans Tier 0 equipment and phases out Tier 1 and 2 equipment (thereby replacing fleets with cleaner equipment), and requires that fleets comply with Best Available Control Technology requirements. Therefore, due to the limited duration of construction activities, the limited amount of time equipment would be located adjacent to any specific sensitive receptor, and implementation of the In-Use Off-Road Diesel-Fueled Fleets Regulation, DPM generated by project construction is not expected to create conditions where the probability is greater than 10 in 1 million of contracting cancer for the Maximally Exposed Individual or to generate ground-level concentrations of non-carcinogenic TACs that exceed a Hazard Index greater than 1 for the Maximally Exposed Individual. Therefore, the pipeline construction component of the proposed project would not expose sensitive receptors to substantial pollutant concentration, and impacts would be less than significant.

Carbon Monoxide Hot Spots

A CO hot spot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. CO hot spots have the potential to violate state and federal CO standards at intersections, even if the broader basin is in attainment for federal and state levels. CO hot spots occur nearly exclusively at signalized intersections operating at level of service (LOS) E or F. Due to increased requirements for cleaner vehicles, equipment, and fuels, CO levels in the state have dropped substantially. All air basins are attainment or maintenance areas for CO. Therefore, more recent screening procedures based on more current methodologies have been developed. The Sacramento Metropolitan Air Quality Management District developed a screening threshold in 2011, which states that any project involving an intersection experiencing 31,600 vehicles per hour or more will require detailed analysis. In addition, the Bay Area Air Quality Management District developed a screening threshold in 2010 which states that any project involving an intersection experiencing 44,000 vehicles per hour would require detailed analysis.

The pipeline construction component of the proposed project would generate vehicle trips during construction in the form of haul trucks and worker commute vehicles. Based on the RCEM emission calculations prepared for project construction, up to 20 daily worker trips would occur during peak construction activities, and up to 10 daily hauling trips would be required. The proposed alignment

would not affect any signalized intersections. The addition of construction traffic to area roadways would not cause any intersections to operate at LOS E or F and would not significantly increase peak hourly volumes. Construction vehicle generation would also be temporary. Therefore, the pipeline construction component of the proposed project would not generate CO hot spots, and potential impacts would be less than significant.

d. Less Than Significant Impact

The potential for an odor impact is dependent on a number of variables, including the nature of the odor source, distance between the receptor and odor source, and local meteorological conditions. During construction, diesel equipment may generate some nuisance odors from equipment exhaust. Additionally, paving activities have the potential to generate odors while laying asphalt. Sensitive receptors near the project site/pipeline alignment include residential uses adjacent to the pipeline loop. However, exposure to odors associated with project construction would be short-term and temporary in nature. In addition, construction activities within the project site is required to comply with SCAQMD Rule 402, which prohibits the discharge of odorous emissions that would create a public nuisance. Further, per CARB's Airborne Toxic Control Measures 13 (California Code of Regulations Chapter 10 Section 2485), the applicant shall not allow idling time to exceed 5 minutes unless more time is required per engine manufacturers' specifications or for safety reasons. Compliance with this regulation would reduce odors from equipment exhaust. Given the short-term nature of construction, compliance with SCAQMD Rule 402, and the distance to the nearest sensitive receptors, it is not anticipated that project construction would generate odors that would affect a substantial number of people.

The following list provides some common types of facilities that are known producers of objectionable odors (Bay Area Air Quality Management District 2017). This list of facilities is not meant to be all-inclusive.

- Wastewater Treatment Plant
- Wastewater Pumping Facilities
- Sanitary Landfill
- Transfer Station
- Composting Facility
- Petroleum Refinery
- Asphalt Batch Plant
- Chemical Manufacturing
- Fiberglass Manufacturing
- Painting/Coating Operations
- Rendering Plant
- Coffee Roaster
- Food Processing Facility
- Confined Animal Facility/Feed Lot/Dairy
- Green Waste and Recycling Operations
- Metal Smelting Plants

The proposed project does not include any of these uses that are typically associated with odor complaints. There would be no operational source of odors associated with the proposed project, as the water pipeline would be completely enclosed and underground. Therefore, the proposed project would not generate substantial amounts of odors adversely affecting a substantial number of people, and impacts would be less than significant.

4.4 Biological Resources

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have substantial adverse effects, 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 (CDFW) or U.S. Fish and Wildlife Service (USFWS)?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?	☐	☐	☒	☐
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?	☐	☐	☒	☐

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
e. Conflict with any local policies or ordinances protecting biological resources, such as 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?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

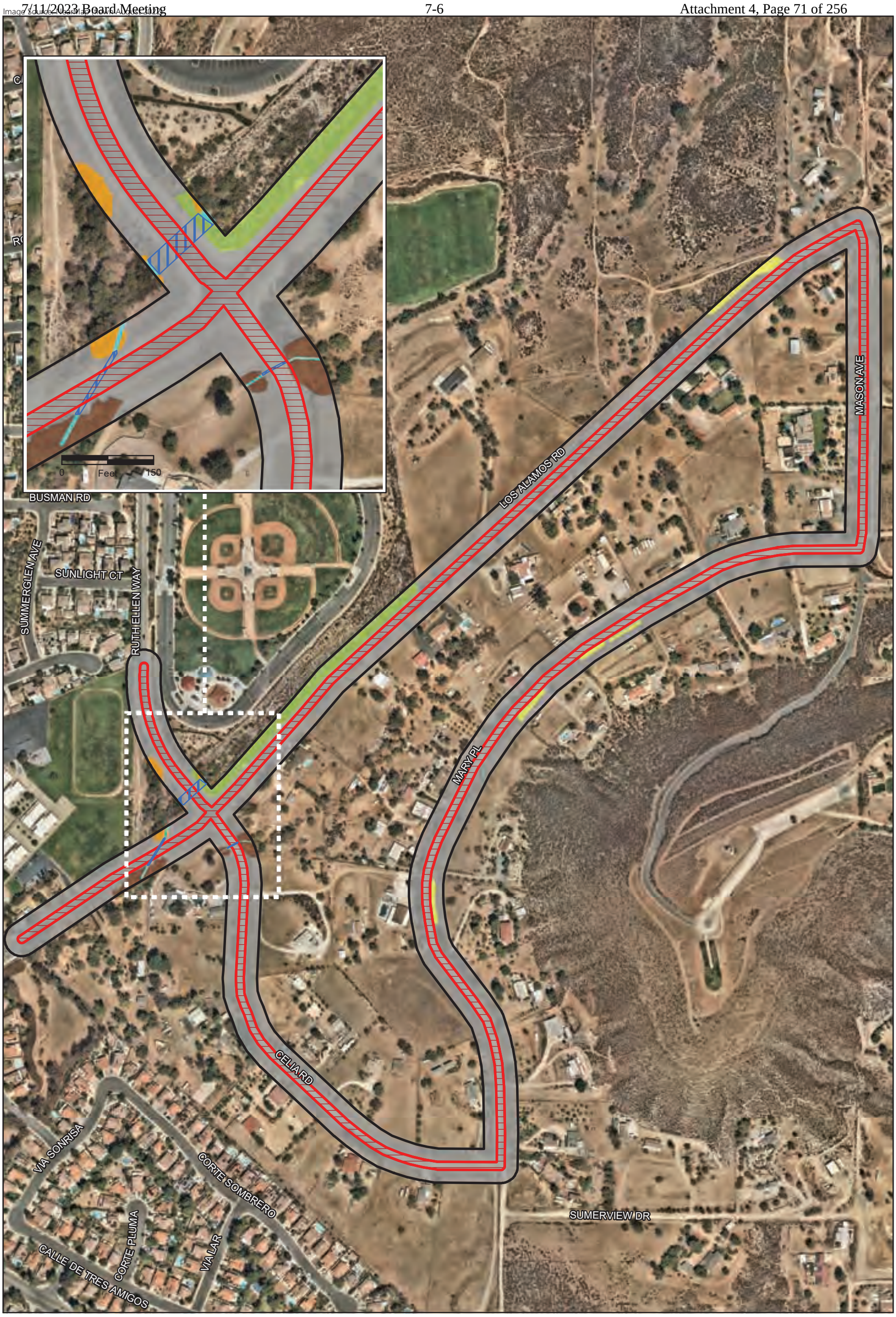
a. Potentially Significant Unless Mitigation Incorporated

This section is based on the Biological Resources Survey prepared by RECON Environmental, Inc. (Appendix B). The survey area included the project site (the pipeline trench plus a 15-foot temporary work area), plus a surrounding 50-foot buffer. The totality of the survey area is 34.12 acres. The biological surveys were conducted on September 27, 2022; biological resources and potential impacts to biological resources are identified in Figure 9.

Vegetation Communities/Land Cover Types

The project site consists of paved and unpaved roadways, which contain one land cover type: urban/developed. The project site is further surrounded by the following six vegetation communities/land cover types: flat-topped buckwheat scrub, Riversidean sage scrub, southern riparian woodland, walnut woodland, non-vegetated channel, and urban/developed. The acreage of these vegetation communities/land cover types is presented in Table 5 and descriptions are provided below.

Image source: Nearmap (flown August 2022)



Project Site
Survey Area
Project Impacts
Culverted Non-vegetated Channel

Vegetation Communities and Land Cover Types

Flat-topped Buckwheat Scrub
Non-vegetated Channel
Riversidean Sage Scrub
Southern Riparian Woodland
Walnut Woodland
Urban/Developed

FIGURE 9
Impacts to Biological Resources

RECON

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Table 5 Vegetation Communities within the Survey Area (acres)		
Vegetation Communities	Project Site/ Pipeline Alignment	Survey Area
Flat-topped Buckwheat Scrub	–	0.24
Riversidean Sage Scrub	–	1.02
Southern Riparian Woodland	–	0.10
Walnut Woodland	–	0.39
Non-vegetated Channel	–	0.03
Urban/developed	7.91	32.34
TOTAL	**7.91**	**34.12**

Urban/Developed Land

Urban/developed land accounts for the entirety of the project site and the majority of the buffer surrounding the project site and occurs as various paved and unpaved roadways, private residences, and a manufactured ditch running adjacent to Los Alamos Road along the northeastern portion of the survey area. Vegetation within urban/developed land consists of ornamental landscaping and a variety of non-native species, including ripgut brome, Peruvian pepper tree, and gum tree.

Non-vegetated Channel

Non-vegetated channel occurs as culverted drainage channels traveling under Ruth Ellen Way, Los Alamos Road, and Celia Road adjacent to the intersection of Ruth Ellen Way, Los Alamos Road, and Celia Road in the western portion of the survey area. No water was flowing at the time of the survey and the channels appear to support either an ephemeral or intermittent flow regime.

Flat-topped Buckwheat Scrub

Flat-topped buckwheat scrub is present in small linear patches (0.24 acre) along Los Alamos Road adjacent to the northeastern portion of the project site and along Mary Place adjacent to the southern portion of the survey area, adjacent to the project site. This vegetation community is comprised entirely of California buckwheat occurring primarily along fence line and appears to be regularly mowed for fuel management along the roadway.

Riversidean Sage Scrub

Riversidean sage scrub is found with moderate vegetation cover along Los Alamos Road adjacent to the northwestern portion of the project site. The Riversidean sage scrub occurs as an isolated patch adjacent to Los Alamos Road that was planted on a graded slope based on historic aerials. The Riversidean sage scrub is dominated by native scrub species such as California buckwheat, coyote brush, brittlebush, and coastal goldenbush.

Southern Riparian Woodland

Southern riparian woodland is found in small, isolated segments on either side of Ruth Ellen Way along Los Alamos Road adjacent to the western portion of the project site. This vegetation community is dominated by western sycamore and contains an understory dominated by mule fat.

Walnut Woodland

Walnut woodland is found in small, isolated segments on either side of Ruth Ellen Way and along Los Alamos Road adjacent to the western portion of the project site. This vegetation community is dominated by southern California black walnut with an understory of mule fat.

The proposed project would result in a total of up to 7.91 acres of direct impacts to urban/developed land. Impacts to urban/developed land are not considered significant as this land cover type is not considered sensitive. Thus, no mitigation is required for impacts to vegetation communities as a result of the proposed project. Therefore, potential impacts would be less than significant and no mitigation would be required.

Plant Species

No sensitive plants were observed within or adjacent to the project site during the biological survey, and none are expected to occur due to the developed nature of the project site and surrounding area. Therefore, no impacts to sensitive plant species are anticipated to result from the proposed project and no mitigation would be required.

Wildlife

No sensitive wildlife was detected within or adjacent to the project site during the biological survey. However, there is a low to moderate potential for coastal California gnatcatcher, southern California rufous-crowned sparrow, Bell's sage sparrow, and migratory/nesting birds to occur adjacent to the project site. These species are discussed in further detail below.

Coastal California Gnatcatcher

Coastal California gnatcatcher is federally listed as threatened, a California Department of Fish and Wildlife (CDFW) species of special concern, and a MSHCP (County of Riverside 2003) covered species. This species is generally found in mature coastal sage scrub habitat consisting of low shrub and sub-shrub species. This species has a low to moderate potential to occur in suitable Riversidean sage scrub habitat adjacent to the project site, outside of the project impact area. Though the identified Riversidean sage scrub habitat adjacent to the project site consists of appropriate vegetation structure for nesting, the Riversidean sage scrub is limited to a small, isolated patch bounded by urban/developed land and lacks connectivity to open space areas. Should this species be present adjacent to the project site, direct impacts to coastal California gnatcatcher are not anticipated as the proposed project would be limited to the developed roadway and the proposed project would avoid removal of suitable Riversidean sage scrub habitat. However, due to the proximity of potentially suitable Riversidean sage scrub to work areas, indirect impacts as a result of construction noise during the breeding season (March 1 through August 15) could result if this species were to nest adjacent to the project site. Indirect impacts to coastal California gnatcatcher if present at the time of project construction would be significant (Impact BIO-1). Implementation of mitigation measure BIO-1 would reduce this impact to a level less than significant.

Southern California Rufous-crowned Sparrow

Southern California rufous-crowned sparrow is a CDFW watch list species and an MSHCP covered species. This species is primarily found in coastal sage scrub, chaparral, and grassland habitats. This

species has low to moderate potential to occur in suitable Riversidean sage scrub habitat adjacent to the project site, outside of the project impact area. Though the Riversidean sage scrub habitat adjacent to the project site consists of appropriate vegetation structure for nesting, the Riversidean sage scrub is limited to a small, isolated patch bounded by urban/developed land and lacks connectivity to open space areas. Should this species be present adjacent to the project site, direct impacts to southern California rufous-crowned sparrow are not anticipated as the proposed project would be limited to the developed roadway and the proposed project would avoid removal of suitable Riversidean sage scrub habitat. However, due to the proximity of potentially suitable Riversidean sage scrub to work areas, indirect impacts as a result of construction noise during the general bird breeding season (February 1 through September 15) could result if this species were to nest adjacent to the project site. Indirect impacts to southern California rufous-crowned sparrow if present at the time of project construction would be significant (Impact BIO-2). Implementation of mitigation measure BIO-2 would reduce this impact to a level less than significant.

Bell's Sage Sparrow

Bell's sage sparrow is a CDFW watch list species and an MSHCP covered species. This species is primarily found in sage scrub and low chaparral habitats. There is one record of this species within one mile of the project area. This species has low to moderate potential to occur in suitable Riversidean sage scrub habitat adjacent to the project site, outside of the project impact area. Though the Riversidean sage scrub habitat adjacent to the project site consists of appropriate vegetation structure for nesting, the Riversidean sage scrub is limited to a small, isolated patch bounded by urban/developed land and lacks connectivity to open space areas. Should this species be present adjacent to the project site, direct impacts to Bell's sage sparrow are not anticipated as the proposed project would be limited to the developed roadway and the proposed project would avoid removal of suitable Riversidean sage scrub habitat. However, due to the proximity of potentially suitable Riversidean sage scrub to work areas, indirect impacts as a result of construction noise during the general bird breeding season (February 1 through September 15) could result if this species were to nest adjacent to the project site. Indirect impacts to Bell's sage sparrow if present at the time of project construction would be significant (Impact BIO-2). Implementation of mitigation measure BIO-2 would reduce this impact to a level less than significant.

Migratory and Nesting Birds

No migratory or nesting birds are anticipated to nest within the project site due to project site's location within a developed roadway. However, the majority of the adjacent habitat including the scrub habitats, woodland habitats, and the non-native Peruvian pepper trees and gum trees found within the urban/developed land, have potential to support migratory and nesting bird species. Urban adapted species in particular have been known to nest within ornamental vegetation or the eves of houses or openings in structures. Direct impacts to migratory and nesting birds are not anticipated as no vegetation would be removed by the proposed project, and the proposed project occurs within a developed roadway with existing vehicular traffic. However, indirect noise impacts may occur to nesting and migratory birds, including southern California rufous-crowned sparrow and Bell's sage sparrow, if they are nesting in the adjacent habitat should construction occur during the general avian breeding season (February 1 to September 15). Impacts to nesting and migratory birds if present at the time of project construction would be considered significant (Impact BIO-2). Implementation of mitigation measure BIO-2 would reduce this impact to a level less than significant.

b. Less Than Significant Impact

Direct impacts associated with the proposed project would be limited to urban/developed land associated with the existing roadway. Project impacts to urban/developed land would be less than significant as this land cover type is not considered sensitive and, therefore, no mitigation would be required.

c. Potentially Significant Unless Mitigation Incorporated

The proposed project would avoid direct impacts to potentially jurisdictional non-wetland waters by avoiding the drainage culverts underlying the roadways. Specifically, construction of trenches would be in the roadway above culverts. If there is not enough depth from pavement to install the pipelines above the culverts, construction of the pipeline would require a tunnel beneath the culverts. Therefore, there would be no impact to culverts and associated drainages and non-wetland waters. However, the proposed project has potential to result in indirect impacts to potential jurisdictional resources occurring adjacent to the work areas (BIO-3). Implementation of mitigation measure BIO-3 would reduce this impact to a level less than significant.

d. Less Than Significant Impact

Wildlife movement corridors are defined as areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors for wildlife travel. Wildlife movement corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas; and facilitate the exchange of genetic traits between populations. Wildlife movement corridors are considered sensitive by resource and conservation agencies.

The project site is comprised of roadways within existing easements and rights-of-way along Los Alamos Road, Mason Avenue, Mary Place, Celia Road, and Ruth Ellen Way. The project is generally bounded by a school and undeveloped lots to the north, residential development and open space to the south, residential development to the west, and undeveloped lots to the east. Though habitats adjacent to the project site likely provides habitat for urban-adapted species and local wildlife movement, it is not anticipated that these habitats would constitute a significant regional corridor due to the project site's location in a developed area and lack of connectivity to off-site areas of open space. Also, the project site is unlikely to support wildlife nursery sites or large roosting or breeding colonies due to the developed nature of the project site. The project site is separated from any MSHCP Conservation Areas by residential development to the east and Summerview Drive, Somerville Road, Willie Lane, and Skipper Drive and existing residential development to the southeast. Therefore, impacts to wildlife movement corridors would be less than significant, and no mitigation required.

e. Less Than Significant Impact

The Murrieta General Plan 2035 (Conservation Element CSV-8: Biological) provides policies related to protecting biological resources and implementing the MSHCP. As discussed in further detail below, the proposed project is consistent with the MSHCP and, therefore, would not conflict within any Murrieta General Plan 2035 policies pertaining to the protection of biological resources. In addition, the City's Development Code (Article III, Chapter 16.42-Tree Preservation) has a Tree

Preservation Ordinance that provides regulations and guidelines for the protection of existing trees. No trees are located within the project site and no conflicts with the development code would occur. Therefore, the proposed project would not conflict with any local policies or ordinances protecting biological resources, and impacts would be less than significant.

f. Less Than Significant Impact

The project area is located within the boundaries of the Western Riverside County MSHCP plan area. A portion of the project area is specifically located within criteria cells in Subunit 5, French Valley/Lower Sedco Hills, identified by the MSHCP. However, the project site is restricted to existing developed roadways within the criteria cells and does not contain biological resources meeting the conservation criteria of the MSHCP. In addition, there are no riparian areas, vernal pools, narrow endemic or criteria area plant species, or burrowing owl habitat protected by the MSHCP within the project site, and the proposed project has been designed to avoid potential riverine areas associated with the culverted drainages underlying the roadway. Specifically, construction of trenches would be in the roadway above culverts. If there is not enough depth from pavement to install the pipelines above the culverts, construction of the pipeline would require a tunnel beneath the culverts. Following these construction measures, there would be no impact to culverts and associated drainages and non-wetland waters. Therefore, there are no MSHCP compliance requirements related to these resources applicable to the proposed project and the proposed project would have no impact. A more detailed analysis of project consistency with the MSHCP is contained in the Biological Resources Report (see Appendix B).

As further described in the biological report, the development of the proposed project, which consists of the installation of water pipelines in previously developed roadways, would not preclude the ability of MSHCP conservation goals to be reached nor is the project area located in an area that would cause indirect impacts to conservation areas in the urban/wildland interface area. Therefore, the proposed project is consistent with the reserve assembly goals of the MSHCP, as well as the guidelines pertaining to the urban/wildlife interface; therefore, impacts would be less than significant.

Mitigation Measures

BIO-1: **Coastal California Gnatcatcher:** Project construction should be conducted outside the coastal California gnatcatcher breeding season, which is March 1 to August 15. If construction must take place during the coastal California gnatcatcher breeding season, a qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(A) Recovery Permit) shall survey Riversidean sage scrub adjacent to the project site for the presence of the coastal California gnatcatcher. Surveys for coastal California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the U.S. Fish and Wildlife Service (USFWS) within the breeding season prior to the commencement of any construction. If the protocol survey concludes that no coastal California gnatcatchers are present or all work is constructed outside of the breeding season (August 16 to February 28), no additional mitigation measures would be necessary. If coastal California gnatcatchers are present, then the following additional mitigation conditions must be met:

a. Between March 1 and August 15, no construction activities shall occur within any portion of the project site where construction activities would result in noise levels exceeding 60 A-weighted decibels [dB(A)] hourly average (or ambient, whichever is higher) at the edge of occupied coastal California gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 dB(A) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by District at least two weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; or

b. At least two weeks prior to the commencement of construction activities during the breeding season, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dB(A) hourly average (or ambient, whichever is higher) at the edge of habitat occupied by the coastal California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed the noise threshold. If the noise attenuation techniques implemented are determined inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16); or

c. Prior to construction during the breeding season, the District shall prepare an MSHCP Consistency Analysis for review by the Western Riverside County Regional Conservation Authority and obtain incidental take coverage for coastal California gnatcatcher via the Participating Special Entity process. The proposed project would pay any necessary mitigation fees for impacts to 7.91 acres prior to construction.

BIO-2: Migratory and Nesting Birds: Construction should be conducted outside the nesting season, which is generally defined as January 15 to August 31. If construction must take place during the nesting season, a qualified biologist shall perform a pre-construction survey for nesting birds. The nesting bird survey shall occur no more than seven days prior to the start of construction. Additionally, raptors (birds of prey) are known to begin nest building in January or February. If construction is to occur between January 1 and February 15, a nesting raptor survey will be conducted within the project area, 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 a qualified biologist until a qualified biologist has verified that the young have fledged or the nest has otherwise become inactive.

BIO-3: Aquatic Resources: The applicant for the proposed project shall avoid indirect impacts to potentially jurisdictional features with best management practices (BMPs), such as the use of silt fences, fiber rolls, and/or gravel bags, implemented. No equipment maintenance or fueling should be performed within or near the non-vegetated channel where petroleum products or other pollutants from the equipment may enter this area.

4.5 Cultural Resources

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of an historical resource pursuant to §15064.5?	☐	☐	☒	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c. Disturb human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant

Construction of the water pipeline within the project site could result in significant impacts to historical resources if any occur within the impact areas. An Archaeological Resources Survey Report was prepared by RECON Environmental, Inc. in November 2022. The report contains a background research, review of historic aerial photographs, and the results of an on-foot survey of the project site (Appendix C). The survey area included the pipeline alignment (7.91-acre project site) and buffer, totaling 9 acres. No significant prehistoric or historic cultural resources were observed during the survey.

Prior to the survey, a records search was requested from the Eastern Information Center (EIC) to identify any previously recorded cultural resources located within a one-mile radius of the project area. In addition, a letter was sent on September 22, 2022 to the Native American Heritage Commission (NAHC) requesting a search of their Sacred Lands File to identify spiritually significant and/or sacred sites or traditional use areas in the project vicinity (see Attachment 2 of Appendix C). The NAHC was also asked to provide a list of local Native American tribes, bands, or individuals that may have concerns or interests regarding cultural resources potentially occurring within the area of potential effect. The record search results showed that there have been 57 previous archaeological investigations, and 33 resources have been recorded within one mile of the project area. Of these, 8 investigations and 2 resources (P-33-0293953 and P-33-006237) cross the project site. A response was received from the NAHC on November 3, 2022 indicating that their Sacred Lands File search results were positive.

The records search identified two cultural resources within the project area. P-33-006237 was recorded in 1995 as a single-family residence with associated outbuildings but the property has since been demolished. P-33-023953 is a 6.33-mile segment of Los Alamos Road recorded in 2014. The roadway has been present since 1891 but recommended not eligible under the National Register of Historic Places (NRHP) and under the California Register of Historical Resources (CRHR) because the road was not a primary route across the region and does not meet the criteria for listing. Therefore, because none of these resources are significant, the proposed project would not cause a substantial adverse change in the significance of an historical resource pursuant to §15064.5. Therefore, impacts would be less than significant.

b. Less Than Significant

The entire pipeline alignment/project site has been disturbed by past development and the possibility of buried significant cultural resources being present is considered low. Therefore, the proposed project would not cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5. Impacts would be less than significant.

c. Less Than Significant

There are no formal cemeteries or recorded burials in the vicinity of the project site. While no human remains are anticipated to be discovered during project construction, in the unexpected event that human remains are encountered during construction, the proposed project would follow the requirements of Health & Safety Code §7050.5 and Public Resources Code §5097.98. Conformance with these regulations would include contacting the County Coroner. 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. Therefore, through regulatory compliance and NAHC protocol, impacts associated with found human remains would be less than significant.

4.6 Energy

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Result in potentially significant environmental impacts 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?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

Construction of the water pipeline component of the proposed project would consume energy during both construction and operation. Energy use during construction would occur within two general categories: vehicle fuel used by workers commuting to and from the construction site, and fuel use by vehicles and other equipment to haul materials and conduct construction activities. While construction activities would consume fuels, project-related consumption of such resources would be temporary and would cease upon the completion of construction. In addition, mobile equipment energy usage during construction would be minimized as the proposed project would comply with CARB's idling regulations, which restrict idling diesel vehicles and equipment to five minutes. Additionally, consistent with state requirements, all construction equipment would meet CARB Tier 3 In-Use Off-Road Diesel Engine Standards. Engines are required to meet certain emission standards, and groups of standards are referred to as Tiers. A Tier 0 engine is unregulated with no emission controls, and each progression of standard level (i.e., Tier 1, Tier 2, Tier 3, etc.) generate lower emissions, use less energy, and are more advanced technologically than the previous tier. CARB's Tier 3 In-Use Off-Road Diesel Engine Standards requires that construction equipment fleets become cleaner and use less energy over time. The fuel consumed during construction would also be typical of similar construction projects and would not require the use of new energy resources beyond what

are typically consumed in California. Therefore, construction of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources, and impacts would be less than significant.

Operational energy usage would be minimal and would consist of occasional maintenance worker vehicle trips. Pipeline construction would not use energy in a wasteful, inefficient, or unnecessary manner. Therefore, operation of the proposed project would not result in a wasteful, inefficient, or unnecessary consumption of energy resources, and impacts would be less than significant.

b. Less Than Significant Impact

Equipment required for pipeline construction would be subject to CARB's idling regulations and Tier 3 In-Use Off-Road Diesel Engine Standards. Operation of the proposed project would not require ongoing or regular use of a substantial amount of energy. Therefore, the proposed project would not conflict with any state or local plans for renewable energy or energy efficiency, and impacts would be less than significant.

4.7 Geology and Soils

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
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?	☐	☐	☒	☐

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a.i, and ii. Less Than Significant Impact

Construction of the water pipeline within the project site could result in adverse effects from earthquakes. Although review of the Alquist-Priolo Earthquake Fault Zone Map (Appendix G of the Murrieta General Plan 2035) identified that no portions of the project area are located within a currently designated State of California or Riverside County earthquake fault zone, the project area is located in a seismically active southern California region. The nearest active fault zone is a Riverside County fault zone approximately 1,400 feet south of the intersection of Celia Road and Mary Place. The nearest fault is a Riverside County fault approximately 400 feet south of the intersection of Celia Road and Mary Place. The Elsinore fault zone is approximately 2.35 miles southwest of the Celia Road

and Mary Place. However, pipeline construction would be limited to construction of a water pipeline and would not introduce any residential, commercial, or other uses that could expose people to strong ground shaking and the potential for surface rupture and ground shaking resulting from earthquakes is not known with certainty but is considered very low. Nonetheless, the Geotechnical Investigation Report prepared for the proposed project (Converse Consultants 2022; Appendix D) includes construction and design recommendations, the implementation of which would ensure avoidance of potential impacts associated with seismic activity. Additionally, construction would be in accordance with the 2022 California Building Code (CBC) to meet all seismic design parameters (see Table 6 of Appendix D), Therefore, through code compliance and adherence to the Geotechnical Investigation recommendations, the impacts related to seismic activity would be less than significant.

a.iii. Less Than Significant Impact

Liquefaction is a phenomenon where water-saturated granular soil loses shear strength during strong ground shaking produced by earthquakes. The loss of soil strength occurs when cyclic pore water pressure increases below the groundwater surface. Potential hazards due to liquefaction include the loss of bearing strength beneath structures; feasibly causing foundation failure or significant settlements and differential settlements. Construction of the water pipeline could result in risk of liquefaction of soils if the soils in which the pipelines were placed were susceptible to liquefaction. However, based on the geotechnical review, there is a very low risk for liquefaction along Ruth Ellen Way, Los Alamos Road, Mason Avenue, and the northeastern section of Mary Place and there is no risk for liquefaction on Celia Road and the southwest section of Mary Place(see Appendix D).

Groundwater was not encountered during boring investigations. Due to the lack of groundwater, in combination with the proposed dense fill soils over Pauba Formation (bedrock), the potential for liquefaction and associated settlement of structures is low. Additionally, review of Exhibit 12-5 of the Murrieta General Plan 2035 determined that the project site is not located within a liquefaction hazard zone (City of Murrieta 2011). Therefore, impacts related to liquefaction would be less than significant.

a.iv. Less Than Significant Impact

Earthwork related to pipeline construction is expected to consist of road excavation and pipeline construction. Seismically induced landslides and other slope failures are common occurrences during or after earthquakes in areas of significant relief. No portions of the project area are located within a currently designated State of California or Riverside County Landslide Zone (Albert A. Webb Associates 2022). The pipeline alignment is located within a relatively flat, paved roadway, and project design and construction would adhere to the recommendations in the standard project-specific geotechnical engineering report. As such, grading and excavation required for the proposed project would not likely increase or exacerbate the potential for landslides to occur. Nonetheless, the Geotechnical Investigation Report prepared for the proposed project (Converse Consultants 2022; see Appendix D) includes construction and design recommendations, the implementation of which would ensure avoidance of potential impacts associated with seismic activity. Additionally, construction would be in accordance with the CBC to meet all seismic design parameters. Therefore, through code compliance and adherence to the Geotechnical Investigation recommendations, the

proposed project would not cause or increase the potential for landslides, and impacts would be less than significant.

b. Less Than Significant Impact

Construction activities associated with the pipeline would temporarily create the potential for increased erosion within existing unpaved roadways; however, as all developed areas would be stabilized consistent with City regulations and recommendations included in the Geotechnical Investigations (see Appendix D). For example, graded areas and fill materials would be stabilized through efforts such as backfill. Erosion potential would be higher in the short-term during construction than in pre-construction conditions. Design requirements include that surfaces exposed in sloped excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5 feet of the unsupported slope edge. Stockpiled soils with a height higher than 6 feet will require greater distance from trench edges (Converse Consultants 2022). Therefore, through regulatory compliance and adherence to the Geotechnical Investigation recommendations, impacts related to soil erosion and loss of topsoil would be less than significant.

c. Less Than Significant Impact

The project site is not underlain by unstable soils and all subsurface soil materials are expected to be excavatable by conventional equipment (Converse Consultants 2022). As described in 4.7aiii above, the project area is not located within a liquefaction hazard zone. As described in the Geotechnical Investigation Report prepared for the proposed project (Converse Consultants 2022; see Appendix D), there is a very low risk for liquefaction along Ruth Ellen Way, Los Alamos Road, Mason Avenue, and the northeastern section of Mary Place. Along Celia Road and the southwest section of Mary Place, there is no risk for liquefaction. Additionally, the potential for landslides or lateral spreading at the project site is considered very low. Furthermore, project excavation and construction would be conducted consistent with requirements of the CBC regarding unstable soils. Nonetheless, the Geotechnical Investigation Report prepared for the proposed project (Converse Consultants 2022; see Appendix D) includes construction and design recommendations, the implementation of which would ensure avoidance of potential impacts associated with seismic activity. Additionally, construction would be in accordance with the CBC to meet all seismic design parameters. Therefore, through code compliance and adherence to the Geotechnical Investigation recommendations, the proposed project would not cause or increase the potential for landslides, and impacts would be less than significant. Adherence to these guidelines would ensure that impacts associated with unstable soils would be less than significant.

d. Less Than Significant Impact

Expansive soils are those known to absorb water resulting in swelling. Expansive soils could cause serious damage to even lightweight structures such as roads, sidewalks, and driveways (https://definecivil.com/expansive-soils/). Construction of the water pipeline component could result in impacts if expansive soils are encountered during construction. According to the Geotechnical Investigation Report prepared for the proposed project (see Appendix D), the project area is underlain by soil types known as undocumented artificial fill and alluvium. Specific design

recommendations are included in the Geotechnical Investigation Report, the implementation of which would ensure avoidance of potential impacts associated with expansive soils. In addition, project excavation and construction would be conducted consistent with requirements of the CBC regarding expansive soils. Adherence to these guidelines and recommendations would ensure that impacts associated with expansive soils would be less than significant.

e. No Impact

The proposed project does not propose the use of septic tanks or alternative wastewater disposal systems. No impact would occur.

f. Potentially Significant unless Mitigation Incorporated

The Murrieta area is generally underlain by highly fossiliferous rock units that include the Pauba formation and Unnamed Sandstone formation. The San Bernardino County Museum Earth Sciences Division has classified the majority of Murrieta as having a high potential for containing significant, nonrenewable paleontological resources (City of Murrieta 2010). Construction of the water pipeline would result in ground-disturbing activities that have the potential to uncover paleontological resources, the loss of which would be a significant impact (Impact GEO-1). Implementation of mitigation measure GEO-1 would ensure that impacts would be reduced to less than significant.

Mitigation Measure

GEO-1 **Paleontological Monitor.** Excavation 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.

4.8 Greenhouse Gas Emissions

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

The District has not adopted its own greenhouse gas (GHG) thresholds of significance for CEQA. The SCAQMD published its Interim CEQA GHG Significance Thresholds for Stationary Sources, Rules, and Plans in 2008 (SCAQMD 2008). The interim thresholds are a tiered approach; projects may be determined to be less than significant under each tier or require further analysis under subsequent tiers. For the proposed project, the most appropriate screening threshold for determining GHG emissions is the SCAQMD proposed Tier 3 screening threshold (SCAQMD 2010); therefore, a significant impact would occur if the proposed project would exceed the SCAQMD proposed Tier 3 screening threshold of 3,000 metric tons carbon dioxide equivalent (MT CO_2E) per year. Based on guidance from the SCAQMD, total construction GHG emissions resulting from a project should be amortized over the lifetime of a project, which is defined as 30 years (SCAQMD 2009).

Construction of the water pipeline within the project site would result in short-term emissions from construction activities. Construction emissions were calculated using RCEM and the parameters discussed in detail in Section 4.3b above. Total construction GHG emissions are summarized in Table 6.

Table 6 Summary of Total Construction GHG Emissions	
Phase/Year	GHG Emissions (MT CO_2E)
Grubbing/Land Clearing	15.60
Grading/Excavation	185.75
Drainage/Utilities/Sub-Grade	88.28
Paving	9.42
Total Construction Emissions	**299.05**
Amortized Construction Emissions	*10*
SOURCE: Appendix A NOTE: Totals may vary due to rounding	

As shown in Table 6, the proposed project would result in a total of 299 MT CO_2E over the entire construction period, which would be 10 MT CO_2E per year when amortized over the lifetime of the proposed project. After installation of the underground pipeline, there would be occasional inspection and maintenance trips. These trips would be minimal and currently occur within the District jurisdiction by existing staff. Inspection and maintenance trips would result in negligible operational emissions and there would be no other source of operational emissions. GHG emissions would be less than the 3,000 MT CO_2E annual screening threshold. Therefore, impacts from construction and operation of the proposed project would be less than significant.

b. Less Than Significant Impact

Executive Order (EO) S-3-05 and EO B-30-15 established GHG emission reduction targets for the state, and Assembly Bill 32 launched the CARB Climate Change Scoping Plan that outlined the reduction measures needed to reach the 2020 target, which the state has achieved. As required by Senate Bill 32, CARB's 2017 Climate Change Scoping Plan outlines reduction measures needed to achieve the interim 2030 target. As detailed in the response under 4.8a above, the proposed project would result in construction GHG emissions below the SCAQMD proposed Tier 3 screening threshold of 3,000 MT CO_2E per year. Construction of the water pipeline within the proposed project would not result in emissions that would adversely affect statewide attainment of GHG emission reduction goals as described in Assembly Bill 32, EOs S-3-05 and B-30-15, and Senate Bill 32. Project emissions would, therefore, have a less than cumulatively considerable contribution to global climate change impacts. The proposed project would not result in a significant increase in regional vehicle miles traveled since vehicle trips would be limited to occasional maintenance trips that would be performed by existing/planned District staff. The proposed project would be consistent with land use designations, as it would supply water for existing residential uses. Because the proposed project would provide water for existing development and because project trips would be limited to occasional maintenance activities, it would not conflict with the transportation-related GHG reduction goals outlined in the Regional Transportation Plan. Further, the proposed project would not conflict with energy efficiency standards or conflict with Southern California Edison's Renewables Portfolio Standard renewable energy goals as these are not applicable to project construction and operation. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and impacts would be less than significant.

4.9 Hazards and Hazardous Materials

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through 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?	☐	☐	☒	☐

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

During the project construction period, hazardous substances used to maintain and operate construction equipment (such as fuel, lubricants, cleaners, paint, oils, 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.

Construction of the water pipeline within the project site would not involve routine transport, use, or disposal of significant hazardous materials. Project construction may involve the use of small amounts of solvents, cleaners, paint, oils and fuel for equipment. The proposed project would comply with a National Pollutant Discharge Elimination System (NPDES) permit program which controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Additionally, project construction would be required to be undertaken in compliance with all applicable federal, state, and local regulations pertaining to the proper use of these common hazardous materials. Compliance with these regulations is mandatory per standard permitting conditions. Therefore, the proposed project would not create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials, and impacts would be less than significant.

b. Less Than Significant Impact

As discussed above in Item 9.a, project construction would require small amounts of hazardous materials. Otherwise, the proposed pipeline would not involve the routine transport, use, or disposal of significant hazardous materials. In addition, the proposed project would be required to implement the Division of Occupational Safety and Health of California Construction Safety Plan/Hazard Communication Program; in case of accidental release, the proposed project would be required to

comply with the Code of Federal Regulations Section 1910.120. Furthermore, project construction would be conducted consistent with all applicable safety regulations and would not be expected to introduce accident conditions that could result in the release of hazardous materials into the environment. Therefore, the proposed project would not create upset and accident conditions that could result in the release of hazardous materials, and impacts would be less than significant.

c. Less Than Significant Impact

Avaxat Elementary School is located approximately 0.6 mile west of the project area. Construction of the water pipeline within the project site would not require the use of acutely hazardous materials and would be limited to the use of small amounts of lubricants, cleaners, paint, oils, adhesives, solvents, asphalt, and fuel for equipment. Use of these common hazardous materials in small quantities would not represent a significant hazard to the public or environment, and the use and handling of hazardous materials during construction would be conducted consistent with all applicable regulations (see Section 4.8a, above). Therefore, impacts related to hazardous emissions within 0.25 mile of a school would be less than significant.

d. Less Than Significant Impact

The project site is not located on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Department of Toxic Substances Control 2022). The proposed project would be required to comply with all applicable federal, state, and local laws and regulations pertaining to the transport, use, disposal, handling, and storage of hazardous waste, including but not limited to Title 49 of the Code of Federal Regulations implemented by Title 13 of the California Code of Regulations, which describes strict regulations for the safe transportation of hazardous materials. Compliance with all applicable federal, state, and local laws related to hazardous materials will ensure that impacts related to emitting hazardous emissions or materials within one-quarter mile of a school will be less than significant. Thus, the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school and is not located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, impacts are less than significant.

e. No Impact

The project area is not located within the vicinity of a private airstrip. The nearest airport is the French Valley Airport, a County-owned public-use airport located on State Route 79, north of the city of Temecula in their sphere of influence, and adjacent to the City's eastern boundary and is located approximately 6.2 miles to the east. Therefore, the project site is not located within an airport land use plan or within two miles of a public airport and would not result in a safety hazard or excessive noise. No impact would occur.

f. Less Than Significant Impact

The emergency response plan in effect in the City is the Emergency Operations Plan approved by the City Council in 2017. The proposed project could temporarily impact street traffic adjacent to the project area during the construction phase due to construction activities into the ROW. Project

construction could temporarily reduce the number of lanes or temporarily close a portion of the project roads. The City requires that projects conducting construction work in City roadway ROWs get encroachment permits approved by the City Department of Public Works. Emergency access must be maintained. Compliance with City requirements for traffic management during construction in the public ROW would ensure that the proposed project would have a less than significant impact. Therefore, the proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

g. Less Than Significant Impact

The project area is located in a Very High Fire Hazard Severity Zone as indicated in exhibit 5.17-1 in the Murrieta General Plan 2035 Final Environmental Impact Report (FEIR; City of Murrieta 2011); however, pipeline construction does not include the construction of habitable structures that could expose people to a significant risk of loss, injury, or death involving wildland fires. Human presence would be limited to temporary construction and periodic maintenance. All construction would be required to comply with fire protection and prevention requirements specified by state law (California Code of Regulations) and the California Division of Occupational Safety and Health. This includes various measures such as easy accessibility of firefighting equipment, proper storage of combustible liquids, no smoking in service and refueling areas, and worker training for firefighter extinguisher use. Further, all new construction is required to comply with the California Fire and Building Codes. Additionally, the proposed project would be required to comply with all regulatory requirements concerning fire protection. Therefore, the exposure of people or structures to significant risk of loss, injury, or death would not be likely to occur and impacts would be less than significant.

4.10 Hydrology and Water Quality

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

Pipeline construction would have the potential to generate erosion/sedimentation and pollutants that could impact water quality. However, the proposed project is subject to the NPDES permit requirements overseen by the District which includes preparation and implementation of a Storm Water Pollution Prevention Program (SWPPP) for the prevention of polluted runoff during construction. The proposed project would be required to prepare and implement a SWPPP identifying feasible BMPs prior to the commencement of construction activities, and to incorporate water quality design features to address potential erosion and siltation impacts. Upon completion of construction activities, the pipeline alignment would be restored to pre-existing conditions. Therefore, through regulatory compliance and implementation of project-specific BMPs, which would be conditions of project approval, the proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality, and impacts would be less than significant.

b. Less Than Significant Impact

Pipeline construction would not increase the amount of impervious surface area within the project area. Pre- to post-project conditions would not see any change in the amount of surface runoff and would not interfere substantially with groundwater recharge. The proposed project would install a water line connection and would not interfere with current ground water supplies in the immediate area since it will be supplying potable water to the area through existing water transmission and distribution systems. The proposed project would not introduce any residential, commercial, or other uses that would use groundwater. Therefore, the proposed project would not significantly decrease groundwater supplies or interfere with groundwater recharge or obstruct sustainable groundwater management, and impacts would be less than significant.

c.i. Less Than Significant Impact

The pipeline alignment would be located within existing ROW that is currently developed with paved and unpaved roads. Construction of the water pipeline within the project site would experience temporary disturbance during construction activities; however, the roads would be returned to existing conditions and drainage patterns would not be altered. The proposed project would implement construction BMPs, identified in the proposed project SWPPP, consistent with the NPDES Construction General Permit and related requirements that would prevent erosion and storm water runoff during construction. Therefore, the proposed project would not substantially alter the drainage pattern of the site or the surrounding area in a manner that could result in substantial erosion, runoff, impediment or redirection of flood flows, and impacts would be less than significant.

c.ii. Less Than Significant Impact

Pipeline construction would not increase in impervious surface areas and would not result in any change to the existing drainage pattern within or surrounding the proposed project pipeline alignment. As described in Section 4.10a above, the proposed project would implement construction BMPs, identified in the proposed project SWPPP, consistent with the NPDES Construction General Permit. Therefore, the proposed project would not substantially increase the rate or amount of

surface runoff in a manner which would result in flooding on- or off-site, and impacts would be less than significant.

c.iii. Less Than Significant Impact

As described in Section 4.10a above, the proposed project would implement construction BMPs, identified in the proposed project SWPPP, consistent with the NPDES Construction General Permit and related requirements that would minimize erosion and prevent pollution from affecting water quality. Post-project runoff flows would be the same as prior to construction. Therefore, the proposed project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, and impacts would be less than significant.

c.iv. Less Than Significant Impact

As shown in exhibit 5.13-2, Flood Hazards in the City General Plan FEIR, the project site is not within a flood hazard zone (City of Murrieta 2011). The proposed project would be limited to construction of a pipeline that would be located underground within developed ROWs and would not impede or redirect flood flows. Additionally, the implementation of the proposed project would not add impervious surfaces. Therefore, the proposed project would not impede or redirect flood flows, and impacts would be less than significant.

d. No Impact

The City of Murrieta General Plan FEIR (Exhibit 5.13-2) identifies the project site as being outside the flood hazard zone. The project area is located approximately 30 miles inland from the Pacific Ocean, and therefore is not subject to risk associated with tsunami. The nearest body of water is Lake Skinner located approximately 13 miles east of the project area. Due to the distance the project site is from Lake Skinner and the low likelihood of a seiche forming, the proposed project would not be susceptible to seiche inundation events. Therefore, the proposed project would not result in impacts associated with flood hazard, tsunami, or seiche zones. No impact would occur.

e. Less Than Significant Impact

The pipeline component of the proposed project would implement construction BMPs, identified in the proposed project SWPPP, consistent with the NPDES Construction General Permit and related requirements that would prevent erosion and pollution from affecting water quality. The proposed project would not decrease groundwater supplies or interfere with groundwater recharge. Therefore, the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan, and impacts would be less than significant.

4.11 Land Use and Planning

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. No Impact

The proposed pipeline would be located within existing roadways. Portions of the roadways would be closed during construction, and some staging activities may also occur along the alignment. Traffic control measures could create a temporary nuisance to residents adjacent to the project area; however, construction activities would be temporary. Access for residents along the alignment would be maintained during construction. Operation of the proposed project would not result in any access restrictions since the pipeline is located underground. The proposed project would not introduce any divisions to the existing community. Ongoing maintenance would also not result in a disruption to the surrounding properties. Therefore, the proposed project would not physically divide an established community. No impact would occur.

b. Less Than Significant Impact

Pipeline construction would be limited to construction of a new water pipeline and would not conflict with the applicable land use/zoning designations within the project area. The pipeline would be located below ground and would not result in any permanent changes aboveground. Therefore, the proposed project would not conflict with any land use plan, policy, or regulation adopted for the

purpose of avoiding or mitigating an environmental effect, and impacts would be less than significant.

4.12 Mineral Resources

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. No Impact

The Conservation Element of the Murrieta General Plan 2035 (Exhibit 8-1) shows no known mineral resources located within the project site (City of Murrieta 2011). Therefore, the proposed project would not result in the loss of availability of known mineral resources that would be of value to the region and the residents of the state or of a locally important mineral resource recovery site. No impact would occur.

b. No Impact

The Murrieta General Plan 2035 does not identify the project area as an existing or former mineral resource site. No impact would occur.

4.13 Noise

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
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 area to excessive noise levels?	☐	☐	☐	☒

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Potentially Significant Unless Mitigation Incorporated

Noise Fundamentals

Noise is defined as sound that is loud, unpleasant, unexpected, or undesired, and therefore, may cause general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment. Decibels (dB) are the standard unit of measurement of the sound

pressure generated by noise sources and are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale for earthquake magnitudes. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the noise energy would result in a 3 dB decrease.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-weighted scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. Noise levels using A-weighted measurements are written as dB(A). It is widely accepted that the average healthy ear can barely perceive changes of 3 dB(A) (increase or decrease) and that a change of 5 dB(A) is readily perceptible. An increase of 10 dB(A) is perceived as twice as loud, and a decrease of 10 dB(A) is perceived as half as loud (Caltrans 2013).

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this study are the equivalent noise level (L_{eq}), the maximum noise level, and the community noise equivalent level (CNEL).

The L_{eq} is the equivalent steady-state noise level in a stated period of time that is calculated by averaging the acoustic energy over a time period; when no period is specified, a 1-hour period is assumed. The maximum noise level is the highest sound level occurring during a specific period.

The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies an additional 5 dB(A) penalty to noise occurring during evening hours, between 7:00 p.m. and 10:00 p.m., and a 10 dB(A) penalty is added to noise occurring during the night, between 10:00 p.m. and 7:00 a.m. These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night.

Regulatory Framework

The District, as a public agency, is not subject to other jurisdictional agencies' established noise standards. Likewise, as a public agency, the District is not subject to the City or County ordinances and would not be required to obtain variances. The District has not established an applicable noise standard of its own for permanent or temporary ambient noise levels. However, the District follows a "good neighbor" approach to adhering to local noise standards. The noise standards of the City are used for the purposes of evaluating the significance of the proposed project's noise levels for the purposes of this analysis under CEQA.

The City outlines their noise regulations and standards within the Municipal Code and the Noise Element of the Murrieta General Plan 2035. The proposed project would not construct a noise sensitive land use or create an operational source of noise. The regulations and standards applicable to pipeline construction would be those associated with construction noise. The Murrieta General Plan 2035 contains the following goal and policies related to construction noise:

- Goal N-4: Reduced noise levels from construction activities.
  - Policy N-4.1: Regulate construction activities to ensure construction noise complies with the City's Noise Ordinance.
  - Policy N-4.2: Limit the hours of construction activity in residential areas to reduce intrusive noise in early morning and evening hours and on Sundays and holidays.
  - Policy N-4.3: Employ construction noise reduction methods to the maximum extent feasible. These measures may include, but not limited to, shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied sensitive receptor areas, and use of electric air compressors and similar power tools, rather than diesel equipment.
  - Policy N-4.4: Encourage municipal vehicles and noise-generating mechanical equipment purchased or used by the City to comply with noise standards specified in the City's Municipal Code, or other applicable codes.
  - Policy N-4.5: Allow exceedance of noise standards on a case-by-case basis for special circumstances including emergency situations, special events, and expedited development projects.
  - Policy N-4.6: Ensure acceptable noise levels are maintained near schools, hospitals, convalescent homes, churches, and other noise-sensitive areas.

Section 16.30.130(A) of the City's Noise Ordinance regulates construction noise. The Noise Ordinance prohibits noise generated by construction activities between the hours of 7:00 p.m. and 7:00 a.m. and on Sundays and holidays. Construction activities shall be conducted in a manner that the maximum noise levels at the affected structures will not exceed those listed in Table 7.

Table 7
City of Murrieta Construction Noise Standards

	Single-Family Residential	Multi-Family Residential	Commercial
Mobile Equipment			
Daily, except Sundays and holidays, 7:00 a.m. to 8:00 p.m.	75 dB(A)	80 dB(A)	85 dB(A)
Daily, except Sundays and holidays, 8:00 p.m. to 7:00 a.m.	60 dB(A)	64 dB(A)	70 dB(A)
Stationary Equipment			
Daily, except Sundays and holidays, 7:00 a.m. to 8:00 p.m.	60 dB(A)	65 dB(A)	70 dB(A)
Daily, except Sundays and holidays, 8:00 p.m. to 7:00 a.m.	50 dB(A)	55 dB(A)	60 dB(A)
dB(A) = A-weighted decibels SOURCE: City of Murrieta Development Code Section 16.30.130.			

Construction of the water pipeline would require the use of mobile construction equipment. Construction equipment would move along the pipeline alignment and would not be located at any one location for a long period of time. Therefore, the applicable standards would be the "Mobile

Equipment" standards shown in Table 7. Construction activities would occur during the daytime hours; therefore, the applicable noise level limit is 75 dB(A) L_{eq}.

Section 16.30.130(K) states the following as it relates to vibration: Operating or permitting the operation of any device that creates vibration that is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property, or at 150 feet from the source if on a public space or public ROW is prohibited. The perception threshold shall be a motion velocity of 0.01 inch per second (in/sec) over the range of 1 to 100 Hertz.

Construction Noise

Noise impacts from construction are a function of the noise generated by equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Table 8 presents a list of noise generation levels for various types of equipment anticipated to be used for construction of the pipeline. The duty cycle is the amount of time that equipment generates the reported noise level during typical, standard equipment operation. The noise levels and duty cycles summarized in Table 8 are based on measurements and studies conducted by Federal Highway Administration (FHWA) and the Federal Transit Authority (FTA).

Table 8
Typical Construction Equipment Noise Levels

Equipment	Maximum Noise Level at 50 Feet [dB(A) L_{max}]	Typical Duty Cycle[3]	Maximum Average Hourly Noise Level [dB(A) L_{eq}]
Concrete Saw	90	20%	83
Compressor	80	40%	76
Dump Truck	84	5%	71
Excavator	85	40%	81
Generator	82	50%	79
Paver	85	50%	82
Sweeper[1]	84	40%	80
Tractor/Loader/Backhoe	80	40%	76
Utility Truck[2]	78	5%	65
Water Truck[1]	84	40%	80

SOURCE: FHWA 2006, FTA 2006.
[1]Sweeper and water truck noise assumed to be comparable to tractor noise.
[2]Utility truck noise assumed to be comparable to flat-bed truck noise.
[3]The dump truck and utility truck duty cycle was adjusted to 5 percent to represent the time this equipment is arriving at and departing from the site. Engines would be idle all other times.

Due to the complex nature of construction sites, construction noise from a linear project, such as a pipeline project, is assessed from the centerline of the alignment and work area. Maximum noise levels would occur when the construction equipment is nearest to a noise sensitive receiver. Although construction equipment may temporarily be located at the point on the alignment nearest to a receiver, throughout the day equipment would move along the alignment. Therefore, the distance

from a receiver to the centerline of the alignment is not the same as the average distance during a given day from the receiver to construction equipment. Thus, average noise levels correlate to the area of active construction. Residential receivers are located in the project vicinity at a distance of 50 feet or more from the pipeline alignment. The total linear length is 10,685 feet, and 200 feet of the pipeline would be constructed per day. For a receiver that is set back 50 feet from the active work area alignment, using the Pythagorean theorem ($a^2 + b^2 = c^2$), it is calculated that the receiver is at an average distance of 112 feet from the construction equipment ($\sqrt{(50^2 + 100^2)} = 112$).

Construction noise levels were calculated assuming the simultaneous use two pieces of construction equipment during each phase. Although more construction equipment would be present on-site, not all would be used at the same time. Noise levels from construction activities are typically considered point sources and would drop off at a rate of -6 dB(A) per doubling of distance over hard site surfaces, such as streets and parking lots. Construction noise attenuation is calculated using the following formula:

$$N_R = N_C + 20 \times \text{Log}(D_C/D_R)$$

Where,

N_R = Noise level at receiver

N_C = Construction equipment reference noise level

D_C = Construction equipment reference noise level distance (i.e., 50 feet)

D_R = Distance to receiver (i.e., 112 feet)

The average noise level at the residential receivers were then calculated for each phase. The results are summarized in Table 9.

Table 9
Construction Equipment Noise Levels

Phase	Equipment	Maximum Average Hourly Noise Level at 50 Feet [dB(A) L_{eq}]	Phase Duration (months/ days)[1]	Active Construction Area (feet/day)	Average Distance to Receiver (feet)	Average Noise Level at Receiver [dB(A) L_{eq}]
Grubbing/ Land Clearing	Concrete Saw	83	0.25/5.5	200	112	76
	Dump Truck	71				
	Total	**83**				
Grading/ Excavation	Excavator	81	2.25/49.5	200	112	75
	Front End Loader	76				
	Total	**82**				
Drainage/ Utilities/ Subgrade	Excavator	81	1.5/33	200	112	74
	Utility Truck	74				
	Total	**82**				
Paving	Paver	82	1/22	200	112	75
	Utility Truck	65				
	Total	**82**				

[1]Assumes 22 working days per month.

As shown in Table 9, construction noise levels have the potential to exceed 75 dB(A) L_{eq} during the grubbing/land clearing phase due to the use of a concrete saw. Construction noise levels during all other phases are not anticipated to exceed 75 dB(A) L_{eq} at the adjacent residential uses. Construction activities would occur during daytime hours between 7:00 a.m. to 8:00 p.m. Pipeline construction noise levels are not anticipated to exceed Noise Ordinance limits. Due to the proximity of construction activities to residences and other noise-sensitive receptors, impacts from construction noise would be potentially disruptive to daily activities (Impact NOI-1). Implementation of mitigation measure NOI-1, which requires the construction contractor to implement BMPs for noise control, daytime construction noise impacts would be reduced to less than significant.

The below-ground pipeline would not generate noise during operation. Noise may be associated with occasional vehicle maintenance trips but these trips would be negligible. The proposed project would have less than significant long-term operational noise impacts.

b. Less Than Significant Impact

Human reaction to vibration is dependent on the environment the receiver is in, as well as individual sensitivity. For example, outdoor vibration is rarely noticeable and generally not considered annoying. Typically, humans must be inside a structure for vibrations to become noticeable and/or annoying (FTA 2006). Project construction would occur within public ROW. Section 16.30.130(K) of the Municipal Code states that vibration levels shall not exceed 0.01 in/sec peak particle velocity (PPV) at 150 feet from the public ROW.

Construction activities produce varying degrees of ground vibration depending on the equipment and methods employed. While ground vibrations from typical construction activities rarely reach levels high enough to cause damage to structures, special consideration must be made when sensitive or historic land uses are near the construction site. The construction activities that typically generate the highest levels of vibration are blasting and impact pile driving. The proposed project would not require pile driving or blasting. The equipment with the greatest potential to generate vibration would be a jack hammer. According to the FTA, jack hammers generate vibration levels of 0.035 in/sec PPV at 25 feet. This vibration level would attenuate to 0.005 in/sec PPV at 150 feet and would therefore not exceed the limit established in Section 16.30.130(K) of the Municipal Code.

Operation of the proposed project would not generate groundborne noise or vibration.

c. No Impact

The project site is not located within the vicinity of a private airstrip. The nearest airport is the French Valley Airport, which is located approximately two miles to the east. The project site is located well outside the noise contours for the French Valley Airport (Riverside County Airport Land Use Commission 2004). Further, the proposed project would not include any sensitive noise receivers. Therefore, the proposed project would not expose people to excessive noise levels. No impact would occur.

Mitigation Measure:

NOI-1: Construction Noise Reduction Measures

- District shall require its contractor to implement the following actions relative to construction noise: District shall conduct construction activities between 7:00 a.m. and 8:00 p.m. on weekdays in accordance with the City of Murrieta Municipal Code, Section 16.30.130(A).
- Prior to construction, the District in coordination with the construction contractor, shall provide written notification to all properties within 50 feet of the proposed project facilities informing occupants of the type and duration of construction activities. Notification materials shall identify a method to contact the District's program manager with noise concerns. Prior to construction commencement, the District program manager shall establish a noise complaint process to allow for resolution of noise problems. This process shall be clearly described in the notifications.
- Stationary noise-generating equipment shall be located as far from sensitive receptors as possible. Such equipment shall also be oriented to minimize noise that would be directed toward sensitive receptors. Whenever possible, other non-noise generating equipment (e.g., roll-off dumpsters) shall be positioned between the noise source and sensitive receptors.
- Equipment and staging areas shall be located as far from sensitive receptors as possible. At the staging location, equipment and materials shall be kept as far from adjacent sensitive receptors as possible.
- Construction vehicles and equipment shall be maintained in the best possible working order; operated by an experienced, trained operator; and shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds).
- Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would require turning off equipment if it would idle for five or more minutes.
- Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

4.14 Population and Housing

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

The project area is within the District's sphere of influence. The proposed water pipeline has been sized to serve the existing residential lots including the future development of the five vacant lots that are located within the project site (Albert A. Webb Associates 2022). The five vacant parcels are similarly zoned rural residential. Additionally, future connections of the pipeline to individual parcels would be provided to individual property owners who opt to connection for District water supply (Albert A. Webb Associates 2022). All future development proposals, including changes to land use, would require discretionary action and additional environmental review by the City. Therefore, the extension of the water pipeline not induce unplanned growth and impacts would be less than significant impact.

b. No Impact

Pipeline construction would construct a waterline to serve the existing project area. All construction would occur within existing easements and ROW. Thus, the proposed project would not displace any existing people or housing. No impact would occur.

4.15 Public Services

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. 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:				
i. Fire protection?	☐	☐	☒	☐
ii. Police protection?	☐	☐	☒	☐
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not in itself result in physical impacts on the environment. Therefore, the analysis that follows addresses pipeline construction within the project site. The water pipeline development provides an additional option for water supply and does not result in the increase in new development to the project area. There are no permits for development currently submitted with the City within the project site area. There are five vacant lots that are zoned rural residential and the proposed project has been designed to incorporate laterals to appropriately serve these lots if these lots are developed in the future. Any development plans, increase in density, or changes in land use within the project site would be subject to additional environmental review and would be at the discretion of the City. At the time of subsequent review, a determination regarding the adequacy of public services based on future proposed development plans would occur. Therefore, as described below, the currently proposed project would not result in a secondary effect for new or expanded public services.

a.i. Less than Significant Impact

Upon completion of construction, the project site would be paved and not require fire services beyond that which is currently required for the project area. Therefore, the proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered facilities, the need for new or physically altered government facilities, or other performance objectives for fire protection services. Impacts would be less than significant.

a.ii. Less than Significant Impact

Pipeline construction would be limited to the construction of a water line. No new residential, commercial, or other uses that would require police protection services would result. Therefore, the proposed project would not require new or expanded police protection facilities. proposed water storage project would not increase in the need for new police protection. Impacts would be less than significant.

a.iii. No Impact

Pipeline construction would be limited to the construction of a water line to serve the existing project area. The proposed project would not construct any residential uses that would generate any new student enrollment that would increase demand for school services. Therefore, the proposed project would not require new or expanded school facilities. No impact would occur.

a.iv. No Impact

Pipeline construction would serve the existing project area and would not alter population in the area or construct any residential uses that would increase demand for parks. Therefore, the proposed project would not require new or expanded park facilities. No impact would occur.

a.v. No Impact

Other public facilities include libraries and government administrative services. The need for new or altered libraries or administrative services is typically associated with an increase in population. Pipeline construction would not construct any residential, commercial, or other uses that would require additional public services. No impact would occur.

4.16 Recreation

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. 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. Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. No Impact

The proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. No population growth would be generated that would increase the use and deterioration of existing recreational facilities. Therefore, no impacts to existing neighborhood and regional parks or other recreational facilities are anticipated to result from the proposed project.

b. No Impact

The proposed project would not result in the construction of recreational facilities, nor would it increase demand for construction or expansion of recreational facilities. No impact would occur.

4.17 Transportation/Traffic

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d. Result in inadequate emergency access?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

Physical improvements associated with the proposed project is limited to construction of the proposed pipeline. The proposed project does not include construction of residential, commercial, or other uses that would generate long-term vehicle trips. Construction activities would include temporary hauling, utility trucks, and employee vehicles.

Access to the project site for pipeline construction would occur along Los Alamos Road, Celia Road, Mason Avenue, Mary Place and Ruth Ellen Way. Consistent with the MMC Section 15.54.140, a Traffic Control Plan (TCP) would be submitted to the City for approval. Excavation areas within the easements and ROW would be plated during non-working hours. To allow the coordination of daily construction activity, the TCP would include measures to ensure that traffic conditions are maintained

as near normal as practicable (MMC Section 15.54.140(F)) and would maintain access and ensure safety. Such measures would likely include standard efforts such as the use of cones, barriers, signs, and flaggers, where applicable. The proposed project would generate vehicle trips during construction in the form of haul trucks and worker commute vehicles; however, the number of vehicles generated would be limited and would not likely result in congestion on nearby roadways. Roadways would be restored to pre-existing conditions once construction is completed.

The proposed project would not impact alternative modes of transportation. Construction would not occur within sidewalks, and the proposed project would maintain pedestrian access during construction. There are no bicycle lanes or bus stops located along Los Alamos Road, Celia Road, Mason Avenue, Mary Place, and Ruth Ellen Way. Therefore, the construction project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, and impacts would be less than significant.

Operational traffic trips would be limited to periodic maintenance and inspection that would not significantly affect intersection and roadway operations. Impacts would be less than significant.

b. Less Than Significant Impact

The proposed project would not result in any changes to the amount of travel required for local residents. Therefore, preparation of a Vehicle Miles Traveled Analysis per CEQA Guidelines Section 15064.3, subdivision (b) was not required, and impacts would be less than significant.

c. Less Than Significant Impact

Pipeline construction would be limited to the constriction of water service infrastructure located within existing easements and ROW along Los Alamos Road, Celia Road, Mason Avenue, Mary Place and Ruth Ellen Way and would not result in any permanent changes to the existing circulation network. Construction would be temporary and include a TCP to allow continued access. Roadways would be restored to pre-existing conditions once construction is completed. Therefore, the proposed project would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses, and impacts would be less than significant.

d. Less Than Significant Impact

Pipeline construction within the easements and ROW would be temporary and include a TCP to allow continued access. The road would be restored to pre-existing conditions once construction is completed. As described in Section 4.17a above, vehicle trips generated during construction and operation would not affect intersection and roadway operations. Therefore, the proposed project would not result in inadequate emergency access to or from the project site, and impacts would be less than significant.

4.18 Tribal Cultural Resources

Would the proposed project:

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

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a.i. Less than Significant

AB 52 establishes a formal consultation process between the lead agency, the District, and all California Native American tribes within the area regarding tribal cultural resource evaluation. AB 52 mandates that the lead agency must provide formal written notification to the designated contact of traditionally and culturally affiliated California Native American tribes that have previously requested notice. Native American tribes are notified early in the project review phase by written notification that includes a brief description of the proposed project, location, and the lead agency's contact information. The tribal contact then has 30 days to request project-specific consultation pursuant to this section (Public Resources Code §21080.1).

As a part of the consultation pursuant Public Resources Code §21080.3.1(b), both parties may suggest mitigation measures (Public Resources Code §21082.3) that can avoid or substantially lessen potential significant impacts to tribal cultural resources or provide alternatives that would avoid significant impacts to a tribal cultural resource. The California Native American tribe may request consultation on mitigation measures, alternatives to the proposed project, or significant effects. The consultation may also include discussion on the environmental review, the significance of tribal cultural resources, the significance of the proposed project's impact on the tribal cultural resources, project alternatives, or the measures planned to preserve or mitigate impacts on resources. Consultation shall end when either (1) both parties agree on the mitigation measures to avoid or mitigate significant effects on a tribal cultural resource, or (2) a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached.

Per AB 52, the District initiated consultation with Native American tribes that are traditionally and culturally affiliated with the geographic area of the proposed project to identify resources of cultural or spiritual value to the tribe. On October 7, 2022, the District sent consultation notification letters to Native American tribes on the District's Master List pursuant to the requirements of AB 52 pertaining to government-to government consultation. Table 10 summarizes the consultation efforts. Six Native American Tribes were contacted, but to date, none have responded.

Table 10 Assembly Bill 52 Consultation				
Tribe	Individual Contacted	Date Letter Mailed	Response Received	Consultation Held
Soboba	Joe Ontiveros	October 7, 2022	DNR	N/A
Pechanga	Ebru Ozdil	October 7, 2022	DNR	N/A
Rincon	Destiny Choloco	October 7, 2022	DNR	N/A
Agua Caliente	Katie Croft	October 7, 2022	October 13, 2022	Declined Consultation
San Manuel	Jessica Mauck	October 7, 2022	November 7, 2022	Declined Consultation
Morongo	Travis Armstrong	October 7, 2022	DNR	N/A
DNR = Did not respond; N/A = Consultation was not requested				

Agua Caliente responded on October 13, 2022 and declined consultation and San Manuel responded on November 7, 2022 and declined consultation. Both Tribes responded within the 30-day period after receiving notification. Based on the level of past disturbance the possibility of buried significant cultural resources being present within the project site is considered low. Therefore, impacts to tribal cultural resources would be less than significant.

a.ii. Less Than Significant

RECON conducted a survey of the pipeline alignment and no significant prehistoric or historic cultural resources were observed during the survey. Given past disturbances, the possibility of buried significant cultural resources being present within the project site is considered low. The survey results coupled with the lack of response from the Native American tribes allows a finding that impacts to tribal cultural resources would be less than significant

4.19 Utilities and Service Systems

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 provided 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 statutes and regulation related to solid waste?	☐	☐	☒	☐

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. No Impact

Pipeline construction would require electricity and a connection to the District's water distribution system but does not involve construction of new or expansion of existing wastewater, natural gas or telecommunication facilities. Upon completion of the pipeline construction, the proposed project would contain and convey potable water but would not generate water demand in and of itself. Further, it would not generate wastewater, nor would the proposed project change the existing on-site stormwater runoff conveyance, collection, or treatment, which would continue according to District standards. No impacts would occur.

b. Less Than Significant Impact

The annexation of the project area to the District would allow the provision of potable water via the new pipeline to an area currently served by private wells. Pipeline construction would be sized to serve the existing project area and would allow the provision of existing water demand levels (Albert A. Webb Associates 2022). Therefore, the proposed project would provide sufficient water supplies to serve the project area, and impacts would be less than significant.

c. No Impact

The proposed project would not construct any uses that would require expanded wastewater treatment capacity. Therefore, the proposed project would not exceed existing wastewater treatment capacity. No impact would occur.

d. Less Than Significant Impact

Project construction would generate small amounts of waste that would likely be disposed of at either the Badlands Sanitary Landfill, located in Moreno Valley, or the El Sobrante Landfill, located in Corona. The Badlands Landfill has a remaining capacity of 15,748,799 cubic yards and a maximum permitted throughput of 4,800 tons per day and the El Sobrante Landfill has a remaining capacity of 143,977,170 cubic yards and a maximum permitted throughput of 16,054 tons per day (California Department of Resources Recycling and Recovery 2020). Both landfills would have sufficient capacity to accommodate the small amounts of waste that would be generated during construction. Operation of the proposed project would not generate any solid waste. Therefore, the proposed project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, and impacts would be less than significant.

e. Less Than Significant Impact

As described in Section 4.19d above, the proposed project would generate small amounts of waste during construction that would be disposed of at either the Badlands Sanitary Landfill, located in Moreno Valley, or the El Sobrante Landfill, located in Corona, which both have adequate capacity. The proposed project would also comply with local regulations pertaining to recycling of construction waste. Operation of the proposed project would not generate any solid waste. Therefore, the proposed project would comply with federal, state, and local statutes and regulation related to solid waste, and impacts would be less than significant.

4.20 Wildfire

Would the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 a 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?	☐	☐	☐	☒

EXPLANATIONS:

The proposed project includes annexation of the project area to the District and construction of approximately 10,685 linear feet of water pipeline. The annexation process is an administrative act that would not result in physical impacts on the environment. Specifically, the approval of the annexation by LAFCO to allow a District boundary change to include the project site is a regulatory function. The approval of the boundary change would not approve development nor implement any land use decisions. Therefore, the analysis that follows addresses potential impacts that could occur as a result of pipeline construction within the project site.

a. Less Than Significant Impact

Construction of the water pipeline component of the proposed project would not disrupt traffic operations. Construction within easements and ROW along Los Alamos Road, Celia Road, Mason Avenue, Mary Place, and Ruth Ellen Way would be temporary and a TCP to allow continued access. Roadways would be restored to pre-existing conditions once construction is completed. The TCP would include measures to ensure maintained access to hospitals, emergency response centers, school locations, communication facilities, highways and bridges, airports, and evacuation routes in

the event of an emergency. Therefore, the proposed project would not impair an adopted emergency response plan or emergency evacuation plan, and impacts would be less than significant.

b. No Impact

Because the proposed project includes a below ground water pipeline, it would not, in combination with environmental factors such as slope or prevailing winds, exacerbate fire risks. In addition, aside from temporary construction and maintenance workers, there would be no occupants on-site. Therefore, no impact would occur.

c. No Impact

Pipeline construction would be limited to construction of a below ground water pipeline. Roadways would be restored to pre-existing conditions once construction is completed, and new fire risks would result. Therefore, the proposed project would not require the installation or maintenance of infrastructure that could exacerbate fire risk or result in temporary or ongoing impacts to the environment. No impact would occur.

d. No Impact

Upon completion of pipeline construction, roadways would be restored to pre-existing conditions. As described in Sections 4.8 and 4.10, the proposed project would not result in any impacts associated with landslides or flooding. Therefore, the proposed project would not expose people or structures to significant risks from runoff, post-fire slope instability, or drainage changes. No impact would occur.

All construction would be required to comply with fire protection and prevention requirements specific by state law (California Code of Regulations) and the California Division of Occupational Safety and Health. This includes various measures such as easy accessibility of firefighting equipment, proper storage of combustible liquids, no smoking in service and refueling areas, and worker training for firefighter extinguisher use. Further, all new construction would be required to comply with the California Fire and Building Codes. Additionally, the proposed project would be required to comply with all regulatory requirements concerning fire protection. As discussed in more detail in Section 4.10, Hydrology and Water Quality, the proposed project would not significantly impact drainage patterns, flooding, or cause landslides. Thus, although the proposed project is located in a high fire hazard area, it would not exacerbate wildfire risks, due to slope, prevailing winds, and other factors, thereby exposing project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire because the proposed project does not include occupants. Further, the proposed project does not require the installation 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 and does not 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. Therefore, impacts would be less than significant.

4.21 Mandatory Findings of Significance

Does the proposed project:

Issue	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to 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. 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 futures projects)?	☐	☒	☐	☐
c. Have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

EXPLANATIONS:

a. Potentially Significant Unless Mitigation Incorporated

As described in Section 4.4a, implementation of mitigation measure BIO-1 would reduce the potential impacts on coastal California gnatcatcher to a level less than significant, implementation of mitigation measure BIO-2 would reduce impacts to migratory and nesting birds to a level less than significant, and implementation of mitigation measure BIO-3 would reduce impacts to aquatic

resources to a level less than significant. The proposed project does not have the potential to result in any other impacts that would substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to 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. As described in Section 4.5a, the proposed project would not impact any historical or archeological resources.

b. Potentially Significant Unless Mitigation Incorporated

Project impacts requiring mitigation are limited to biological resources, paleontological resources and noise. As described in Section 4.4a, implementation of mitigation measure BIO-1 would reduce impacts related on coastal California gnatcatcher to a level less than significant, implementation of mitigation measure BIO-2 would reduce impacts to migratory and nesting birds species to a level less than significant, and implementation of mitigation measure BIO-3 would reduce impacts related to aquatic resources to a level less than significant. Implementation of BIO-1, BIO-2, and BIO-3 would also ensure consistency with the MSHCP. As described in 4.7f, implementation of mitigation measure GEO-1 would reduce impacts to paleontological resources to a level less than significant. As described in Section 4.13a, implementation of mitigation measure NOI-1, would reduce noise impacts to less than significant. By mitigating project-level impacts to a level less than significant, the proposed project would not contribute to existing cumulative impact. As described throughout the IS/MND, all other project-level impacts would be less than significant without mitigation. Consequently, the proposed project would not result in any project-level significant impacts that could contribute to an existing cumulative impact on the environment.

c. Less Than Significant Impact

As described in Sections 4.1 through 4.20, the proposed project would not result in any substantial adverse direct or indirect impacts to human beings. Therefore, impacts would be less than significant.

5.0 Preparers

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6.0 Sources Consulted

Project Description

Riverside, County of
2003 Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Prepared by Dudek and Associates. Approved June 17. https://www.wrc-rca.org/Permit_Docs/MSHCP/MSHCP-Volume%201.pdf.

U.S. Geological Survey (USGS)
1979 Murrieta quadrangle, Township 7 South, Range 3 West.

Aesthetics

California Department of Transportation (Caltrans)
2022 California State Scenic Highway Scenic Map. https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed August 8.

Agriculture and Forest Resources

California Department of Conservation
2018 California Important Farmland Finder. https://maps.conservation.ca.gov/dlrp/ciff/.

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2017 California Environmental Quality Act Air Quality Guidelines. May.

Office of Environmental Health Hazard Assessment (OEHHA)
2015 Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments (Guidance Manual), February.

Sacramento Metropolitan Air Quality Management District (SMAQMD)
2022 Road Construction Emissions Model, Version 9.0.1.

South Coast Air Quality Management District (SCAQMD)
1993 SCAQMD CEQA Air Handbook. November.

2008 Final Localized Significance Threshold Methodology. July.

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2003 Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Prepared by Dudek and Associates. Approved June 17. https://www.wrc-rca.org/Permit_Docs/MSHCP/MSHCP-Volume%201.pdf.

Geology and Soils

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Converse Consultants
2022 Geotechnical Investigation Report EMWD Los Alamos Hills Pipeline Project, City of Murrieta, Riverside County, California. Converse Project No. 22-81-144-02. November 28.

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2010 General Plan Update Existing Conditions Background Report. January. https://www.murrietaca.gov/DocumentCenter/View/736/Existing-Conditions-Background-Report-PDF.

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South Coast Air Quality Management District (SCAQMD)
2008 Interim CEQA GHG Significance Thresholds for Stationary Sources, Rules, and Plans.

2009 Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group 14. http://www.aqmd.gov/ceqa/handbook/GHG/2009/nov19mtg/ghgmtg14.pdf.

2010 Greenhouse Gas CEQA Significance Thresholds Stakeholder Working Group 15. September 28.

Hazards and Hazardous Materials

Department of Toxic Substances Control

2022 DTSC's Hazardous Waste and Substances Site List – Site Cleanup (Cortese List). https://dtsc.ca.gov/dtscs-cortese-list/.

Murrieta, City of

2011 Murrieta General Plan Update 2035 Final Environmental Impact Report, Section 5.17 Fire Protection, exhibit 5.17-1. https://www.murrietaca.gov/DocumentCenter/View/762/05-17---Fire-Protection-PDF.

Hydrology and Water Quality

2011 Murrieta General Plan Update 2035 Final Environmental Impact Report, Section 5.13 Hydrology, Drainage, and Water Quality, exhibit 5.13-2, Flood Hazards. https://www.murrietaca.gov/DocumentCenter/View/758/05-13---Hydrology-Drainage-and-Water-Quality-PDF

Mineral Resources

Murrieta, City of

2011 Murrieta General Plan Update. Exhibit 8-1 of the Conservation Element. https://www.murrietaca.gov/DocumentCenter/View/4362/08---Conservation-Elementpdf.

Noise

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2013 Technical Noise Supplement. November.

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2006 Roadway Construction Noise Model User's Guide. FHWA-HEP-05-054, SOT-VNTSC-FHWA-05-01. Final Report. January.

Federal Transit Administration (FTA)

2006 Transit Noise and Vibration Impact Assessment. Washington, DC. May.

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2004 Riverside County Airport Land Use Compatibility Plan. Background Data Volume 2 West County Airports. October 2004.

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Utilities and Service Systems

Albert A. Webb Associates

2022 Los Alamos Hills Water Facilities Feasibility Report. September 29.

California Department of Resources Recycling and Recovery (CalRecycle)

2020 Solid Waste Information System. https://www2.calrecycle.ca.gov/swfacilities/Directory/.

APPENDICES

APPENDIX A

Air Quality Calculations

Los Alamos Hills Water Facilities
Calculation Details

Pipeline Length:

10,685	feet
5,280	feet/mile
2.0	miles

Project Area:

5	feet wide
53,425	square feet
43,560	square feet/acre
1.2	acres

Asphalt Export:

5,275	feet paved
5	feet wide
0.25	feet deep (3 inch asphalt depth)
6,593.75	cubic feet
27	cubic feet/cubic yard
244.21	cubic yards
20	cubic yard truck capacity
13	hauling trips (rounded up)
0.25	month grubbing/land clearing phase
22	work days/month
5.5	days
45	cubic yards/day (rounded up)

Soil Export:

10,685	feet long
5	feet wide
10.00	feet deep
534,250	cubic feet
27	cubic feet/cubic yard
19,787	cubic yards
20	cubic yard truck capacity
990	hauling trips (rounded up)
2.25	month grading/excavation phase
22	work days/month
49.5	days
400	cubic yards/day (rounded up)

Road Construction Emissions Model, Version 9.0.1

Daily Emission Estimates for -> Los Alamos Hills Water Facilities

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	2.93	31.00	23.83	3.35	1.17	2.18	1.54	1.09	0.45	0.06	6,190.50	1.01	0.13	6,254.15
Grading/Excavation	2.96	31.45	27.35	3.47	1.29	2.18	1.60	1.14	0.45	0.08	8,118.76	1.01	0.43	8,272.78
Drainage/Utilities/Sub-Grade	2.93	30.92	23.21	3.33	1.15	2.18	1.53	1.08	0.45	0.06	5,850.22	1.01	0.08	5,897.92
Paving	0.48	5.01	3.40	0.19	0.19	0.00	0.15	0.15	0.00	0.01	935.61	0.17	0.01	943.80
Maximum (pounds/day)	2.96	31.45	27.35	3.47	1.29	2.18	1.60	1.14	0.45	0.08	8,118.76	1.01	0.43	8,272.78
Total (tons/construction project)	0.13	1.43	1.16	0.15	0.06	0.10	0.07	0.05	0.02	0.00	324.78	0.05	0.01	329.65

Notes:

Project Start Year ->	2023
Project Length (months) ->	5
Total Project Area (acres) ->	1
Maximum Area Disturbed/Day (acres) ->	0
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	45	0	90	400	40
Grading/Excavation	400	0	600	0	400	40
Drainage/Utilities/Sub-Grade	0	0	0	0	400	40
Paving	0	0	0	0	400	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Los Alamos Hills Water Facilities

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.09	0.07	0.01	0.00	0.01	0.00	0.00	0.00	0.00	17.02	0.00	0.00	15.60
Grading/Excavation	0.07	0.78	0.68	0.09	0.03	0.05	0.04	0.03	0.01	0.00	200.94	0.02	0.01	185.75
Drainage/Utilities/Sub-Grade	0.05	0.51	0.38	0.05	0.02	0.04	0.03	0.02	0.01	0.00	96.53	0.02	0.00	88.28
Paving	0.01	0.06	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.29	0.00	0.00	9.42
Maximum (tons/phase)	0.07	0.78	0.68	0.09	0.03	0.05	0.04	0.03	0.01	0.00	200.94	0.02	0.01	185.75
Total (tons/construction project)	0.13	1.43	1.16	0.15	0.06	0.10	0.07	0.05	0.02	0.00	324.78	0.05	0.01	299.05

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model Version 9.0.1

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Los Alamos Hills Water Facilities	
Construction Start Year	2023	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	5.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	2	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	2.00	miles
Total Project Area	1.20	acres
Maximum Area Disturbed/Day	0.22	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County. NEW LINK 8-2-2022.

https://maps.conservation.ca.gov/cgs/gmc/

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing	20.00		
	Grading/Excavation	20.00		400.00
	Drainage/Utilities/Sub-Grade	20.00		
	Paving	20.00		
Asphalt	Grubbing/Land Clearing	20.00		45.00
	Grading/Excavation	20.00		
	Drainage/Utilities/Sub-Grade	20.00		
	Paving	20.00		

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Road Construction Emissions Model, Version 8.1.0 1/9/2023

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.25	0.50		1/1/2023
Grading/Excavation	2.25	2.25		1/9/2023
Drainage/Utilities/Sub-Grade	1.50	1.50		3/19/2023
Paving	1.00	0.75		5/4/2023
Totals (Months)	5			

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	30.00			0	0.00
Miles/round trip: Grading/Excavation	30.00			20	600.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			0	0.00
Miles/round trip: Paving	30.00			0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grading/Excavation (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Paving (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.04	0.54	4.14	0.15	0.06	0.02	2,268.54	0.00	0.36	2,374.85
Tons per const. Period - Grading/Excavation	0.00	0.01	0.10	0.00	0.00	0.00	56.15	0.00	0.01	58.78
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.01	0.10	0.00	0.00	0.00	56.15	0.00	0.01	58.78

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	30.00			3	90.00
Miles/round trip: Grading/Excavation	30.00			0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			0	0.00
Miles/round trip: Paving	30.00			0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grading/Excavation (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Paving (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.08	0.62	0.02	0.01	0.00	340.28	0.00	0.05	356.23
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00	0.98
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00	0.98

Road Construction Emissions Model, Version 8.1.0 1/9/2023

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values		
User Input				
Miles/ one-way trip	20		Calculated	Calculated
One-way trips/day	2		Daily Trips	Daily VMT
No. of employees: Grubbing/Land Clearing	10		20	400.00
No. of employees: Grading/Excavation	10		20	400.00
No. of employees: Drainage/Utilities/Sub-Grade	10		20	400.00
No. of employees: Paving	10		20	400.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.02	0.91	0.07	0.05	0.02	0.00	317.66	0.00	0.01	319.68
Grading/Excavation (grams/mile)	0.02	0.91	0.07	0.05	0.02	0.00	317.66	0.00	0.01	319.68
Draining/Utilities/Sub-Grade (grams/mile)	0.02	0.91	0.07	0.05	0.02	0.00	317.66	0.00	0.01	319.68
Paving (grams/mile)	0.02	0.91	0.07	0.05	0.02	0.00	317.66	0.00	0.01	319.68
Grubbing/Land Clearing (grams/trip)	1.04	2.75	0.29	0.00	0.00	0.00	68.26	0.07	0.03	79.50
Grading/Excavation (grams/trip)	1.04	2.75	0.29	0.00	0.00	0.00	68.26	0.07	0.03	79.50
Draining/Utilities/Sub-Grade (grams/trip)	1.04	2.75	0.29	0.00	0.00	0.00	68.26	0.07	0.03	79.50
Paving (grams/trip)	1.04	2.75	0.29	0.00	0.00	0.00	68.26	0.07	0.03	79.50
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.06	0.93	0.08	0.04	0.02	0.00	283.14	0.01	0.01	285.42
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0.78
Pounds per day - Grading/Excavation	0.06	0.93	0.08	0.04	0.02	0.00	283.14	0.01	0.01	285.42
Tons per const. Period - Grading/Excavation	0.00	0.02	0.00	0.00	0.00	0.00	7.01	0.00	0.00	7.06
Pounds per day - Drainage/Utilities/Sub-Grade	0.06	0.93	0.08	0.04	0.02	0.00	283.14	0.01	0.01	285.42
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.02	0.00	0.00	0.00	0.00	4.67	0.00	0.00	4.71
Pounds per day - Paving	0.06	0.93	0.08	0.04	0.02	0.00	283.14	0.01	0.01	285.42
Tons per const. Period - Paving	0.00	0.01	0.00	0.00	0.00	0.00	3.11	0.00	0.00	3.14
Total tons per construction project	0.00	0.05	0.00	0.00	0.00	0.00	15.57	0.00	0.00	15.70

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
User Input								
Grubbing/Land Clearing - Exhaust	1		5.00			8.00		40.00
Grading/Excavation - Exhaust	1		5.00			8.00		40.00
Drainage/Utilities/Subgrade	1		5.00			8.00		40.00
Paving								0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grading/Excavation (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Paving (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.04	0.31	0.01	0.00	0.00	151.24	0.00	0.02	158.32
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.44
Pounds per day - Grading/Excavation	0.00	0.04	0.31	0.01	0.00	0.00	151.24	0.00	0.02	158.32
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	3.74	0.00	0.00	3.92
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.04	0.31	0.01	0.00	0.00	151.24	0.00	0.02	158.32
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.01	0.00	0.00	0.00	2.50	0.00	0.00	2.61
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.01	0.00	0.00	0.00	6.65	0.00	0.00	6.97

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			2.18	0.01	0.45	0.00
Fugitive Dust - Grading/Excavation			2.18	0.05	0.45	0.01
Fugitive Dust - Drainage/Utilities/Subgrade			2.18	0.04	0.45	0.01

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Air Compressors	0.51	4.83	3.47	0.19	0.19	0.01	750.53	0.04	0.01	753.33
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.33	3.66	2.58	0.13	0.13	0.01	592.67	0.03	0.00	594.72
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.19	3.26	1.55	0.08	0.07	0.01	500.11	0.16	0.00	505.50
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Generator Sets	0.61	7.34	5.43	0.26	0.26	0.01	1,246.07	0.05	0.01	1,250.23
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.50	3.29	3.57	0.13	0.12	0.01	1,279.89	0.41	0.01	1,293.67
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.18	1.92	1.71	0.11	0.10	0.00	246.18	0.08	0.00	248.83
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.30	4.46	3.07	0.15	0.14	0.01	603.15	0.20	0.01	609.64
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Grubbing/Land Clearing	pounds per day	2.86	29.96	22.82	1.09	1.06	0.06	5,415.84	1.00	0.04	5,454.18
	Grubbing/Land Clearing	tons per phase	0.01	0.08	0.06	0.00	0.00	0.00	14.89	0.00	0.00	15.00

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Air Compressors	0.51	4.83	3.47	0.19	0.19	0.01	750.53	0.04	0.01	753.33
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.33	3.66	2.58	0.13	0.13	0.01	592.67	0.03	0.00	594.72
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.19	3.26	1.55	0.08	0.07	0.01	500.11	0.16	0.00	505.50
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Generator Sets	0.61	7.34	5.43	0.26	0.26	0.01	1,246.07	0.05	0.01	1,250.23
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.50	3.29	3.57	0.13	0.12	0.01	1,279.89	0.41	0.01	1,293.67
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.18	1.92	1.71	0.11	0.10	0.00	246.18	0.08	0.00	248.83
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.30	4.46	3.07	0.15	0.14	0.01	603.15	0.20	0.01	609.64
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	2.86	29.96	22.82	1.09	1.06	0.06	5,415.84	1.00	0.04	5,454.18
Grading/Excavation	tons per phase	0.07	0.74	0.56	0.03	0.03	0.00	134.04	0.02	0.00	134.99

Road Construction Emissions Model, Version 8.1.0 1/9/2023

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Air Compressors	0.51	4.83	3.47	0.19	0.19	0.01	750.53	0.04	0.01	753.33
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.33	3.66	2.58	0.13	0.13	0.01	592.67	0.03	0.00	594.72
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.19	3.26	1.55	0.08	0.07	0.01	500.11	0.16	0.00	505.50
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Generator Sets	0.61	7.34	5.43	0.26	0.26	0.01	1,246.07	0.05	0.01	1,250.23
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.50	3.29	3.57	0.13	0.12	0.01	1,279.89	0.41	0.01	1,293.67
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.18	1.92	1.71	0.11	0.10	0.00	246.18	0.08	0.00	248.83
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.30	4.46	3.07	0.15	0.14	0.01	603.15	0.20	0.01	609.64
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	2.86	29.96	22.82	1.09	1.06	0.06	5,415.84	1.00	0.04	5,454.18
Drainage/Utilities/Sub-Grade	tons per phase	0.05	0.49	0.38	0.02	0.02	0.00	89.36	0.02	0.00	89.99

Road Construction Emissions Model, Version 8.1.0 1/9/2023

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Pavers	0.19	2.88	1.88	0.09	0.08	0.00	455.22	0.15	0.00	460.13
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Paving	pounds per day	0.42	4.09	3.32	0.14	0.14	0.01	652.47	0.17	0.01	658.38
Paving	tons per phase	0.00	0.04	0.04	0.00	0.00	0.00	7.18	0.00	0.00	7.24
Total Emissions all Phases (tons per construction period) =>		0.13	1.36	1.04	0.05	0.05	0.00	245.47	0.05	0.00	247.23

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

APPENDIX B

Biological Resources Survey Report

December 30, 2022

Mr. Joseph Broadhead
Principal Water Resource Specialist
Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572

Reference: Biological Resources Survey for the Los Alamos Hills Water System Project (RECON Number 9878-9)

Dear Mr. Broadhead:

This letter details the results of a biological resources survey conducted for the Los Alamos Hills Water System Project (project). This biological constraints letter has been prepared to provide necessary information to the Eastern Municipal Water District (District) for environmental analysis of the project.

1.0 Introduction

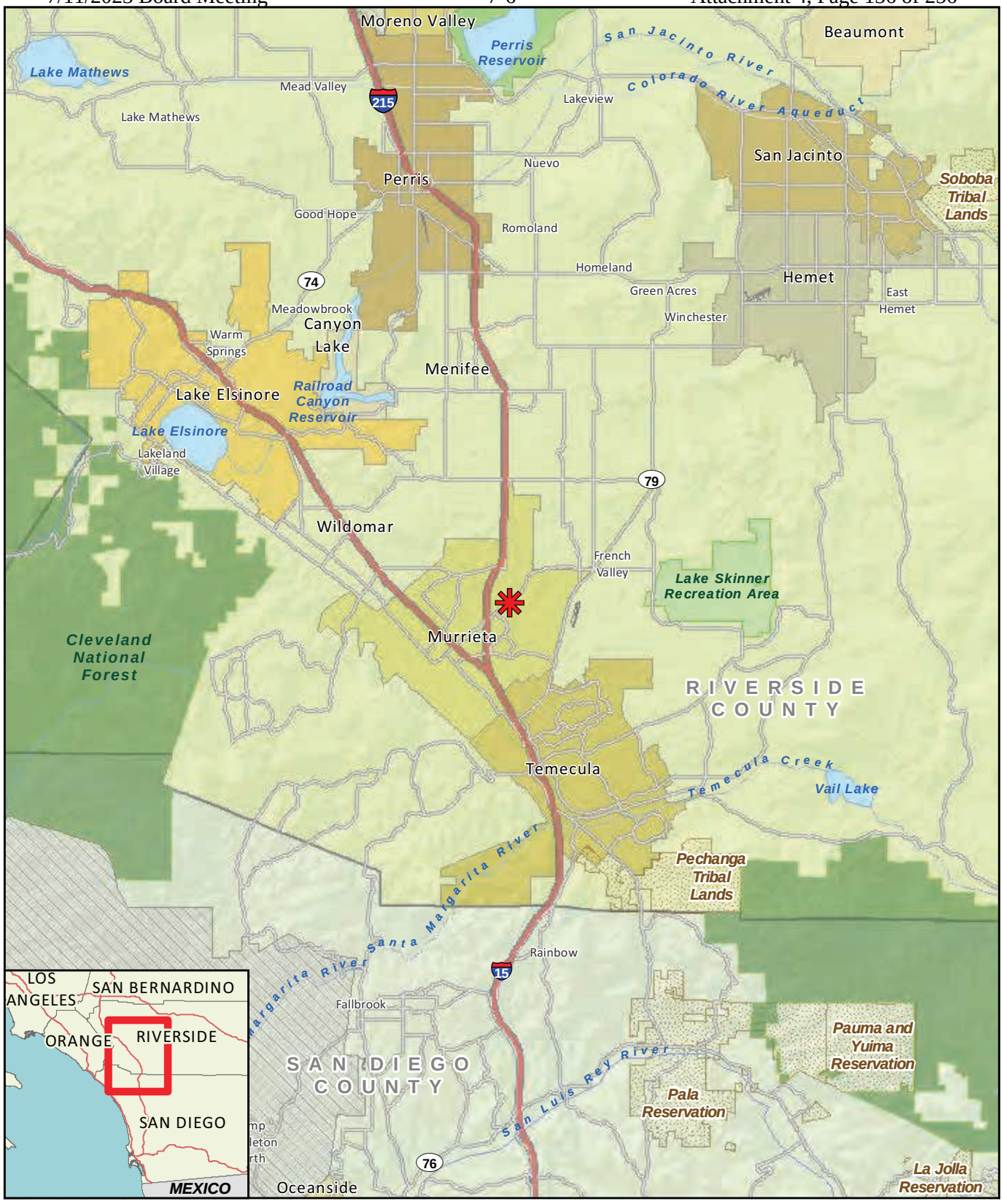
1.1 Project Location

The project is located in the city of Murrieta, California (Figures 1 through 3). Regional access to the project site is provided via Interstate 215, located approximately 0.45 mile to the east, and local access is provided via Interstate 215 south to east on Los Alamos Road. The project site is in the U.S. Geological Survey (USGS) Murrieta quadrangle, Township 7 South, Range 3 West (USGS 1979; see Figure 2). The project site is comprised of paved and unpaved ground, either bare or with existing and disturbed vegetation, within existing easements and rights-of-way along Los Alamos Road, Mason Avenue, Mary Place, Celia Road, and Ruth Ellen Way. The project site is generally bounded by a school and undeveloped lots to the north, residential development and open space to the south, residential development to the west, and undeveloped lots to the east.

1.2 Project Description

The project consists of the installation of a pipeline loop within existing city streets with diameters ranging from 8 to 12 inches. The total distance covered by the proposed Los Alamos Hills Water System loop pipeline is approximately 10,685 linear feet or approximately 2 miles. The following are the pipeline segments that make up the project:

- Los Alamos Road 12-inch pipe, Celia Road to Mason Avenue (approximately 3,350 linear feet)
- Celia Road 8-inch pipe, Mary Place to Mason Road (approximately 2,000 linear feet)
- Mason Road 8-inch pipe, Mary Place to Los Alamos Road (approximately 1,260 linear feet)
- Mary Place 8-inch pipe, Celia Road to Mason Avenue (approximately 3,400 linear feet)
- Ruth Ellen Way 12-inch pipe, Los Alamos Road to the northern property line of Rail Ranch Elementary School (approximately 675 linear feet)



Project Site

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FIGURE 1
Regional Location

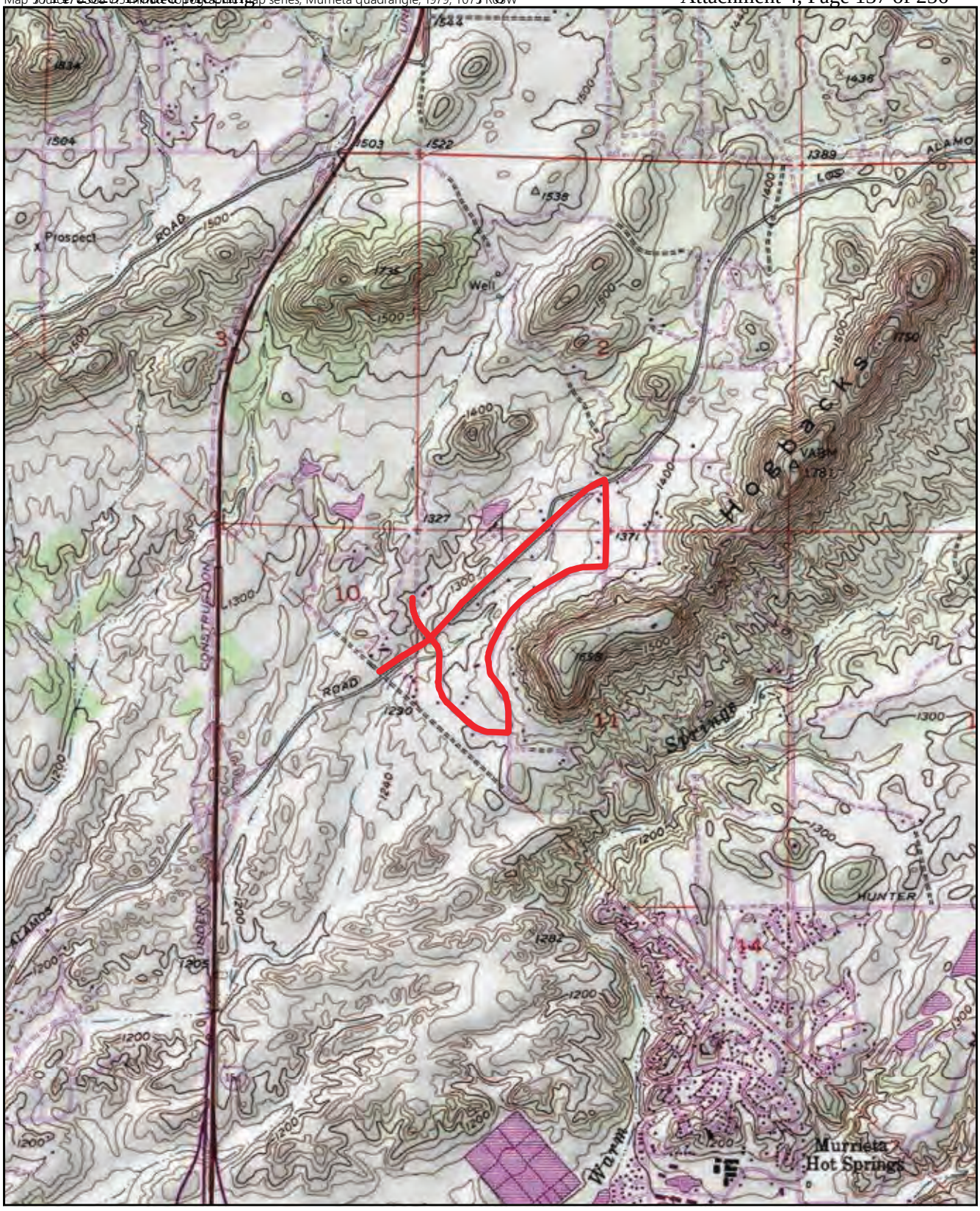

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FIGURE 2
Project Site on USGS Map

FIGURE 3
Project Site on Aerial Photograph

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All pipeline segments and work areas are proposed within existing paved and unpaved roadways and roadsides, therefore avoiding direct impacts to sensitive biological resources. However, there is native upland and wetland vegetation adjacent to these roadways that may support sensitive species subject to indirect impacts of construction activities.

1.3 Regional Context

The project is located within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area (County of Riverside 2003; Figure 4). The MSHCP was designed to conserve approximately 500,000 acres of habitat, including 347,000 acres of existing conservation on public and quasi-public land and 153,000 acres of conservation on privately owned lands. Areas of privately owned lands considered for potential conservation are identified as Criteria Cells, which are intended to facilitate assessment of conservation potential under the MSHCP. In this way, the MSHCP directs future conservation efforts to occur within these Criteria Cells.

A portion of the project site is located within Criteria Cells in Subunit 5, French Valley/Lower Sedco Hills, identified by the MSHCP. The southernmost portion of Mary Place is located within Cell Group D of Cell 5977, the central and northern portions of Mary Place and the southern portion of Mason Avenue are located within Cell Group E of Cell 5873, and the northern portion of Mason Avenue is located within Cell Group F of Cell 5783. However, the project site is restricted to existing developed roadways within the criteria cells and does not contain biological resources meeting the conservation criteria presented in Table 3-16 of the MSHCP. The portions of the project site along Los Alamos Road, Ruth Ellen Way, and Celia Road are not located within a Cell Group. Additionally, the project site is located within the Narrow Endemic Plant Species Survey Area 4, the Criteria Area Species Survey Area, and the western burrowing owl (*Athene cunicularia hypugaea*) survey area identified in the MSHCP (County of Riverside 2003).

2.0 Methods

RECON Environmental, Inc. (RECON) biologists Cailin Lyons and Chelsea Polevy conducted a general biological survey within the project site and surrounding 15-foot buffer (herein referred to as the survey area), on September 27, 2022. During the general biological survey, RECON biologists mapped vegetation communities, recorded vegetation and habitat characteristics, and noted wildlife and plant species apparent at the time of the survey. Vegetation communities were mapped in the field on a digital map of the survey area. Plants were visually identified in the field and wildlife species were identified visually with the aid of binoculars or based on identification of calls, scat, tracks, or burrows. Private property was surveyed with binoculars from public rights-of-way.

3.0 Background Research

Prior to conducting field surveys, RECON conducted a search of existing biological data for the project site, including a review of biological databases for sensitive plant and animal species reported within one mile of the project site, and a review of the project site's physical characteristics (e.g., location, elevation, soils/substrate, topography). Databases consulted included the California Natural Diversity Database (California Department of Fish and Wildlife [CDFW] 2022) and the U.S. Fish and Wildlife Service (USFWS) All Species Occurrences Database (USFWS 2022a). In addition, a review of the National Wetlands Inventory was conducted to identify any potential wetlands or water resources present in the vicinity of the project site (USFWS 2022b).

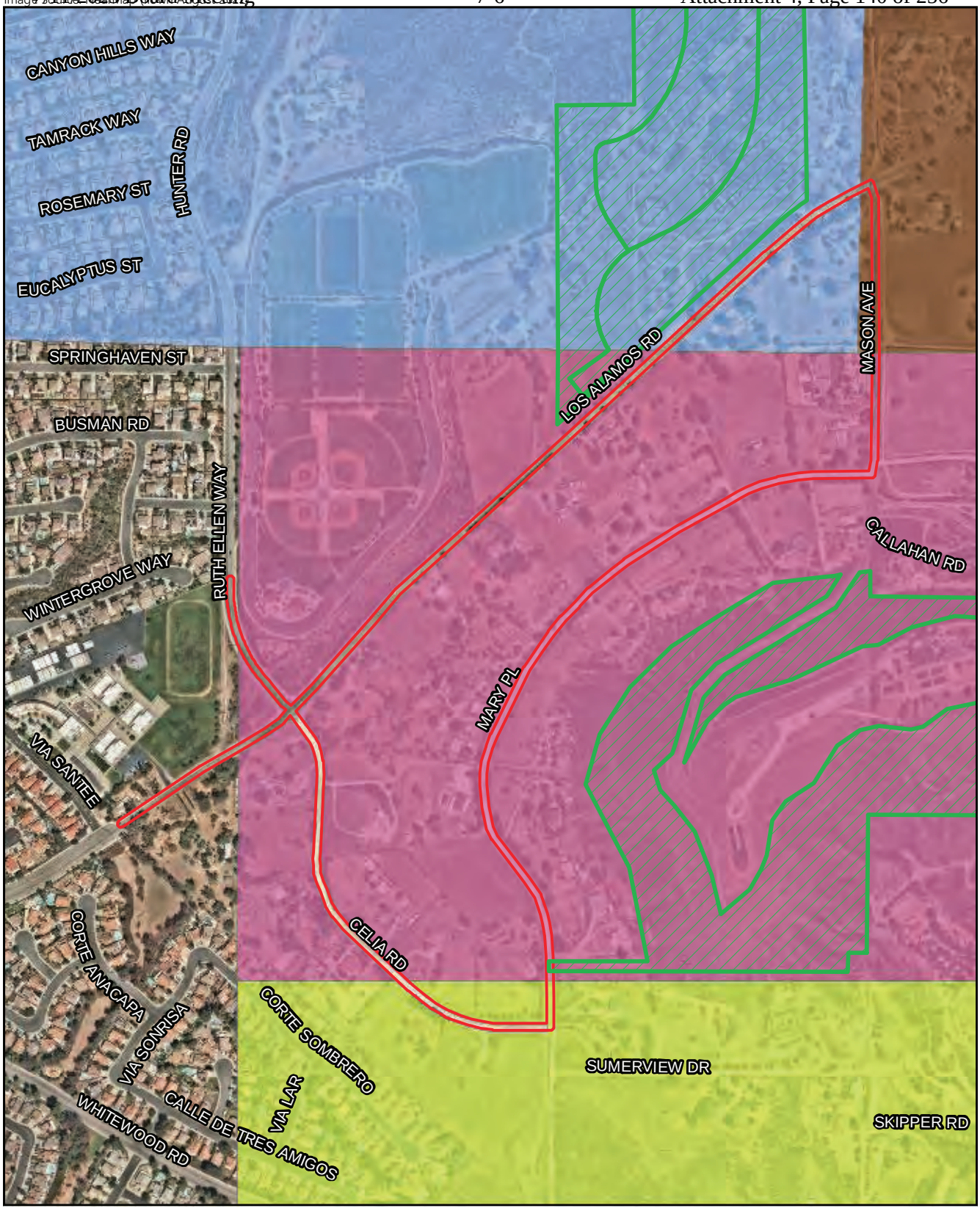

FIGURE 4
Project in Relation to MSHCP Area

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Based on the database search, there are a number of sensitive species known within one mile of the project site. The project site consists entirely of urban/developed land and is primarily surrounded by development with small segments of scrub and woodland habitats. Thus, the potential for many species to occur is evaluated based on the habitat within the project site, as well as within land adjacent to the project site. Three sensitive wildlife species, coastal California gnatcatcher (*Polioptila californica californica*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), and Bell's sage sparrow (*Artemisiospiza* [=*Amphispiza*] *belli belli*) were determined to have a low to moderate potential to occur adjacent to the project site. Additional plant and wildlife species that were evaluated based on the database review but are not expected or have low potential to occur based on the records search and habitat conditions are discussed in Attachments 1 and 2, respectively.

4.0 Existing Biological Resources

4.1 Vegetation Communities

The project site supports only urban/developed. The buffer surrounding the project site supports six vegetation communities/land cover types: flat-topped buckwheat scrub, Riversidean sage scrub, southern riparian woodland, walnut woodland, non-vegetated channel, and urban/developed (Figure 5). The acreages of these vegetation communities and land cover types are listed in Table 1 and described below.

Table 1
Vegetation Communities and Land Cover Types within Survey Area
(acres)

Vegetation Communities	Project Site	Survey Area (Project Site Plus 50-foot Buffer)
Flat-topped Buckwheat Scrub	–	0.24
Riversidean Sage Scrub	–	1.02
Southern Riparian Woodland	–	0.10
Walnut Woodland	–	0.39
Non-vegetated Channel	–	0.03
Urban/developed	7.91	32.34
TOTAL	**7.91**	**34.12**

Urban/developed accounts for the entirety of the project site and the majority of the buffer surrounding the project site and occurs as various paved and unpaved roadways, private residences, and a manufactured ditch running along Los Alamos Road adjacent to the northeastern portion of the project site. Vegetation within urban/developed land consists of ornamental landscaping and a variety of non-native species, including ripgut brome (*Bromus diandrus*), Peruvian petter tree (*Schinus molle*), and gum tree (*Eucalyptus* spp.).

Non-vegetated channel occurs as culverted drainage channels traveling under Ruth Ellen Way, Los Alamos Road, and Celia Road adjacent to the intersection of Ruth Ellen Way, Los Alamos Road, and Celia Road in the western portion of the project site. No water was flowing at the time of the survey and the channels appear to support either an ephemeral or intermittent flow regime.

Flat-topped buckwheat scrub is present in small linear patches (0.24 acre) along Los Alamos Road adjacent to the northeastern portion of the project site and along Mary Place adjacent to the southern portion of the project site. This vegetation community is comprised entirely of California buckwheat (*Eriogonum fasciculatum*) occurring primarily along fence line and appears to be regularly mowed for fuel management along the roadway.

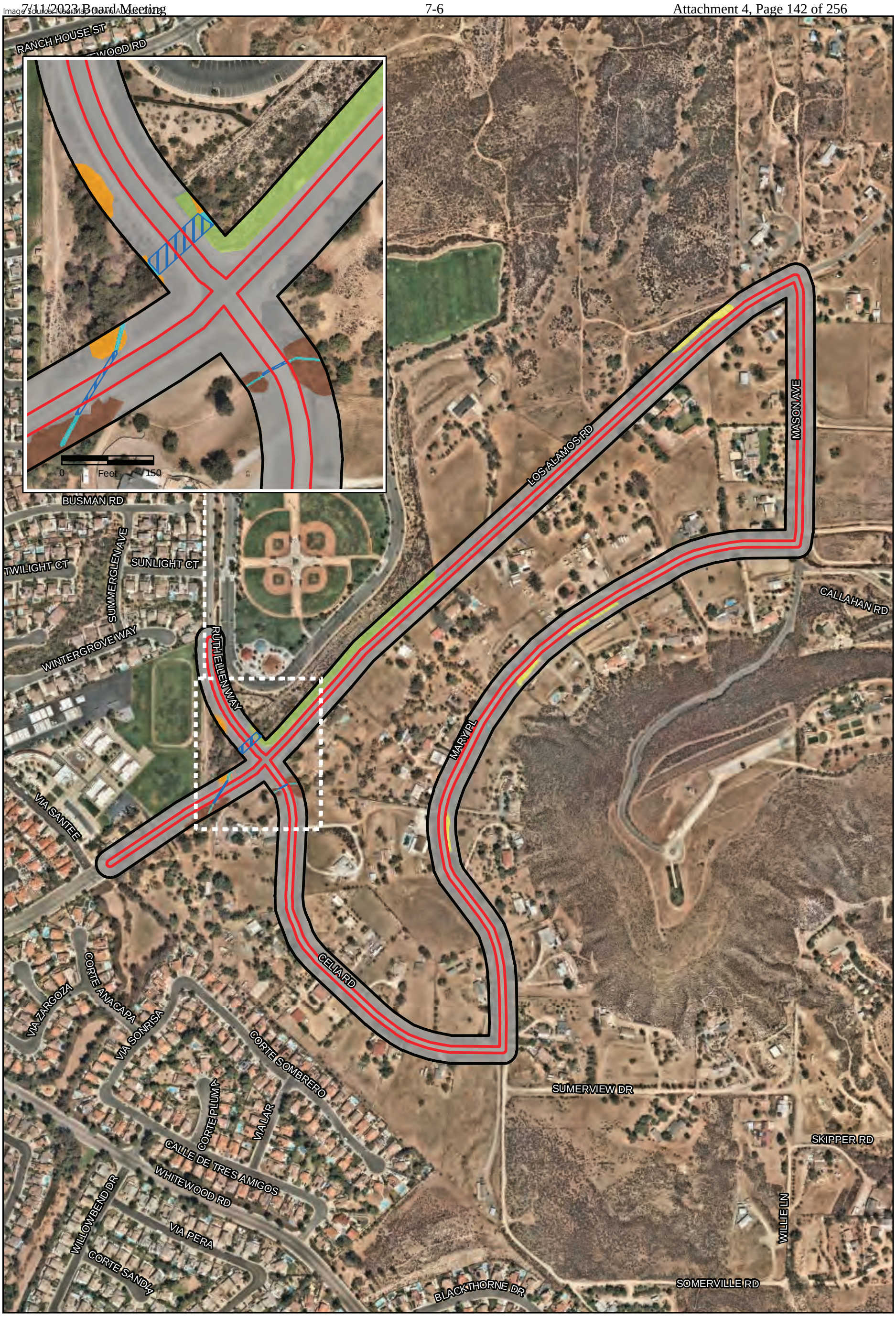

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FIGURE 5
Existing Biological Resources

Riversidean sage scrub is found with moderate vegetation cover along Los Alamos Road adjacent to the northwestern portion of the project site. The Riversidean sage scrub occurs as an isolated patch that was planted on a graded slope based on historic aerials. The Riversidean sage scrub is dominated by native scrub species such as California buckwheat, coyote brush (*Baccharis pilularis*), brittlebush (*Encelia farinosa*), and coastal goldenbush (*Isocoma menziesii*).

Southern riparian woodland is found in small, isolated segments on either side of Ruth Ellen Way along Los Alamos Road adjacent to the western portion of the project site. This vegetation community is dominated by western sycamore (*Platanus racemosa*) and contains an understory dominated by mule fat (*Baccharis salicifolia*).

Walnut woodland is found in small, isolated segments on either side of Ruth Ellen Way and along Los Alamos Road adjacent to the western portion of the project site. This vegetation community is dominated by southern California black walnut (*Juglans californica*) with an understory of mule fat.

4.2 Sensitive Plant Species

No sensitive plants were observed within or adjacent to the project site during the biological survey. Sensitive plant species known to occur within one mile of the project site, based on a database review, are presented in Attachment 1.

4.3 Sensitive Wildlife Species

No sensitive wildlife was detected within or adjacent to the project site during the biological survey. Sensitive wildlife species known to occur within one mile of the project site, based on a database review, are presented in Attachment 2.

Coastal California Gnatcatcher. Coastal California gnatcatcher is federally listed as threatened, a CDFW species of special concern, and an MSHCP covered species. This species is generally found in mature coastal sage scrub habitat consisting of low shrub and sub-shrub species. This species has low to moderate potential to occur in suitable Riversidean sage scrub habitat adjacent to the project site, outside of the project impact area. Though the Riversidean sage scrub habitat adjacent to the project site consists of appropriate vegetation structure for nesting, the Riversidean sage scrub is limited to a small, isolated patch bounded by urban/developed land and lacks connectivity to open space areas.

Southern California Rufous-crowned Sparrow. Southern California rufous-crowned sparrow is a CDFW watch list species and an MSHCP covered species. This species is primarily found in coastal sage scrub, chaparral, and grassland habitats. This species has low to moderate potential to occur in suitable Riversidean sage scrub habitat adjacent to the project site, outside of the project impact area. Though the Riversidean sage scrub habitat adjacent to the project site consists of appropriate vegetation structure for nesting, the Riversidean sage scrub is limited to a small, isolated patch bounded by urban/developed land and lacks connectivity to open space areas.

Bell's Sage Sparrow. Bell's sage sparrow is a CDFW watch list species and an MSHCP covered species. This species is primarily found in sage scrub and low chaparral habitats. There is one record of this species within one mile of the project site. This species has low to moderate potential to occur in suitable Riversidean sage scrub habitat adjacent to the project site, outside of the project impact area. Though the Riversidean sage scrub habitat adjacent to the project site consists of appropriate vegetation structure for nesting, the Riversidean sage scrub is limited to a small, isolated patch bounded by urban/developed land and lacks connectivity to open space areas.

Migratory and Nesting Birds. The majority of the project site and adjacent habitat, including the scrub habitats, woodland habitats, and the non-native Peruvian pepper trees and gum trees found within the urban/developed land, has potential to support migratory and nesting bird species. Urban-adapted species in particular have been known to nest within ornamental vegetation or the eves of houses or openings in structures. In addition, several ground nesting species have the potential to nest within the open areas found within the urban/developed land within and adjacent to the project site.

4.4 Aquatic Resources

No potentially jurisdictional wetlands, including riparian/riverine areas or vernal pools, were observed within the project site; however, potentially jurisdictional non-wetland waters occur adjacent to the project site within the culverted drainage channels traveling under Ruth Ellen Way, Los Alamos Road, and Celia Road. The culverted drainage channels would likely be considered waters of the U.S. under U.S. Army Corps of Engineers (USACE) jurisdiction and waters of the state under Regional Water Quality Control Board (RWQCB), and CDFW jurisdiction.

4.5 Wildlife Movement Corridors and Nursery Sites

The project site is located on roadways and rights-of-way that are primarily surrounded by development and residential properties. Though habitats adjacent to the project site likely provides habitat for urban-adapted species and local wildlife movement, it is not anticipated that these habitats would constitute a significant regional corridor due to the project site's location in a developed area and lack of connectivity to off-site areas of open space. Also, the project site is unlikely to support wildlife nursery sites or large roosting or breeding colonies due to the developed nature of the project site.

4.6 MSHCP Consistency

The project site is located within the boundaries of the MSHCP (WRCRCA 2003). The MSHCP allocates responsibility for assembly and management of its Conservation Areas to local, state, and federal governments, as well as private and public entities engaged in construction that may impact MSHCP covered species. As lead agency, the District is not a participant in the MSHCP; however, due to the project's location within a Criteria Cell, the project has been evaluated for consistency with the MSHCP to demonstrate it would not prevent implementation of the plan's conservation goals and objectives as described in further detail below. The project is located in an existing developed roadway and no components of the project are within existing or proposed reserves defined by the MSHCP. Portions of the project site located on private property along Mary Place and Mason Avenue are located within existing criteria areas defined by the MSHCP. Portions of the project site are located within Cell Group D of Cell 5977, within Cell Group E of Cell 5873, and within Cell Group F of Cell 5783. Conservation described for Cell Groups D, E, and F is to contribute to the assembly of Proposed Core 2 and will focus on riparian scrub, woodland and forest habitat along Warm Springs Creek and adjacent chaparral, coastal sage scrub, and grassland habitat. The segments of the project site within Cell Groups D, E, and F are located outside of each cell group's focus area described for conservation. Furthermore, the project site is separated from the area described for conservation by Callahan Road and existing residential development to the east and Summerview Drive, Somerville Road, Willie Lane, and Skipper Drive and existing residential development to the southeast. Development of the project, which consists of a water system in a previously developed roadway, will not preclude the ability of MSHCP conservation goals to be reached in Cell Groups D, E, or F, nor is the project site located in an area that would cause indirect impacts to any conservation areas in the MSHCP. Therefore, the project is consistent with the reserve assembly goals of the MSHCP, as well as the guidelines pertaining to the urban/wildlife interface.

The presence of riparian/riverine areas and vernal pools as defined by the MSHCP was evaluated during the general biological survey conducted by RECON in 2022. No riparian areas or vernal pools occur within the project site. The project has been designed to avoid potential riverine areas associated with the culverted drainage that underlies Los Alamos Road, Celia Road, and Ruth Ellen Way. Thus, the project is consistent with the requirements for riparian/riverine areas and vernal pools contained in the MSHCP. The project also incorporates best management practices to ensure that construction-related runoff and pollutants do not enter adjacent riverine areas.

The project site is within an area designated in the MSHCP as a Narrow Endemic Plant Species Survey Area for Munz's onion (*Allium munzii*), San Diego ambrosia (*Ambrosia pumila*), many-stemmed dudleya (*Dudleya multicaulis*), spreading navarretia (*Navarretia fossalis*), California Orcutt grass (*Orcuttia californica*), and Wright's trichocoronis (*Trichocoronis wrightii* var. *wrightii*). The project site is also within an area designated in the MSHCP as a Criteria Area Species Survey Area for Parish's brittlescale (*Atriplex parishii*), Davidson's saltscale (*Atriplex serenana* var. *davidsonii*), thread-leaved brodiaea (*Brodiaea filifolia*), round-leaved filaree (*California macrophylla* [=*Erodium macrophyllum*]), smooth tarplant (*Centromadia pungens* ssp. *laevis* [=*Hemizonia pungens* ssp. *laevis*]), Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*), little mousetail (*Myosurus minimus* [=*Myosurus minimus* ssp. *apus*]), and mud nama (*Nama stenocarpum*). Suitable habitat for these species were evaluated during the general biological survey conducted by RECON in 2022 and are not expected to occur within the developed roadway associated with the project site. San Diego ambrosia and mud nama require floodplain habitats, which are absent within the project site. Many stemmed dudleya requires Altamont, Auld, Bosanko, Claypit, or Porterville clay soils, which are absent within the project site. Spreading navarretia and California Orcutt grass are vernal pool endemic plants, and no suitable vernal pool habitat occurs on-site. Wright's trichocoronis occurs only in alkali floodplains along the San Jacinto River, which is located approximately 8.45 miles northwest of the project site. Moreover, no suitable alkali floodplains are present in or adjacent to the project site. Parish's brittlescale, Davidson's saltscale, smooth tarplant, Coulter's goldfields, and little mousetail require alkali soils and are generally found in alkali vernal pools, alkali scrub, alkali grassland, alkali playa, and alkali floodplains, which are absent from the project site. Thread-leaved brodiaea occur in mudflat, vernal pool, mesic grassland, mixed native-nonnative grassland, and alkali grassland habitat, which are absent from the project site. Munz's onion and round-leaved filaree occur in open cismontane woodland and valley and foothill grassland with friable clay soils, which are absent from the project site.

The project site also falls within an area designated by the MSHCP as a survey area for burrowing owl. Suitable habitat for this species was evaluated during the general biological survey conducted by RECON in 2022. The project site is not anticipated to support this species due to the project site's location within an existing developed roadway, and lack of suitable burrows or burrow surrogates within or adjacent to the project site.

Furthermore, the project site does not fall within the MSHCP survey areas for amphibians, mammals, or Delhi Sands flower-loving fly and is not anticipated to result in any impacts to these species due to lack of suitable habitat.

5.0 Avoidance, Minimization, and Mitigation for Project Impacts

Project impacts to urban/developed land would be less than significant and would not require mitigation. The project would not impact any sensitive vegetation communities, sensitive plant species, wildlife movement corridors, or nursery sites; therefore, no mitigation would be required. Potential direct and/or indirect impacts to sensitive wildlife species and potentially jurisdictional aquatic resources would be addressed through the following avoidance, minimization, and mitigation measures below.

5.1 Vegetation Communities and Land Cover Types

The project would result in a total of up to 7.91 acres of direct impacts to urban/developed land (Figure 6). Impacts to urban/developed land are not considered significant as this land cover type is not considered sensitive. Thus, no mitigation is required for impacts to vegetation communities as a result of the project.

5.2 Sensitive Wildlife

Coastal California Gnatcatcher. This species has a low to moderate potential to occur adjacent to the project site. Should this species be present adjacent to the project site, direct impacts to coastal California gnatcatcher are not anticipated as the project would be limited to the developed roadway and the project would avoid removal of suitable Riversidean sage scrub habitat. However, due to the proximity of potentially suitable Riversidean sage scrub to work areas, indirect impacts as a result of construction noise during the breeding season (March 1 through August 15) could result if this species were to nest adjacent to the project site. Measures to avoid impacts to coastal California gnatcatcher are described below.

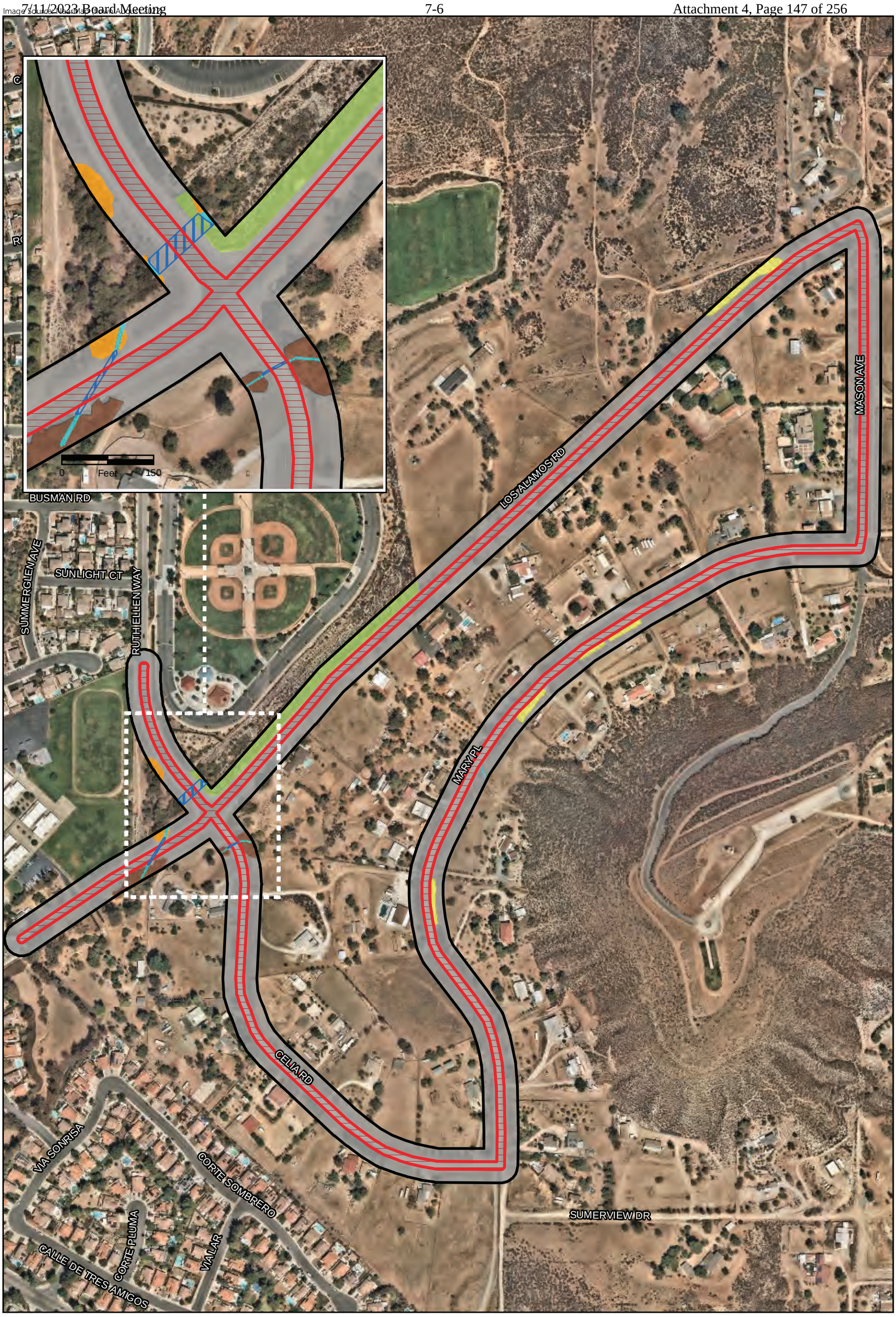
AMM-BIO-1: Coastal California Gnatcatcher

Project construction should be conducted outside the coastal California gnatcatcher breeding season, which is March 1 to August 15. If construction must take place during the coastal California gnatcatcher breeding season, a qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(A) Recovery Permit) shall survey Riversidean sage scrub adjacent to the project site for the presence of the coastal California gnatcatcher. Surveys for coastal California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the USFWS within the breeding season prior to the commencement of any construction. If the protocol survey concludes that no coastal California gnatcatchers are present or all work is constructed outside of the breeding season (August 16 to February 28), no mitigation measures would be necessary. If coastal California gnatcatchers are present, then the following conditions must be met:

a. Between March 1 and August 15, no construction activities shall occur within any portion of the project site where construction activities would result in noise levels exceeding 60 A-weighted decibels [dB(A)] hourly average (or ambient, whichever is higher) at the edge of occupied coastal California gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 dB(A) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the District at least two weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; or

b. At least two weeks prior to the commencement of construction activities during the breeding season, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dB(A) hourly average (or ambient, whichever is higher) at the edge of habitat occupied by the coastal California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed the noise threshold. If the noise attenuation techniques implemented are determined inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16); or

Image Source: ESRI Maps (Aerial) August 2022



Project Site
Survey Area
Project Impacts
Culverted Non-vegetated Channel

Vegetation Communities and Land Cover Types

Flat-topped Buckwheat Scrub
Non-vegetated Channel
Riversidean Sage Scrub
Southern Riparian Woodland
Walnut Woodland
Urban/Developed

RECON

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FIGURE 6
Impacts to Biological Resources

c. Prior to construction during the breeding season, the District shall prepare an MSHCP Consistency Analysis for review by the Western Riverside County Regional Conservation Authority and obtain incidental take coverage for coastal California gnatcatcher via the Participating Special Entity process. The project would pay any necessary mitigation fees for impacts to 7.91 acres prior to construction.

Migratory and Nesting Birds. Direct impacts to nesting and migratory birds are not anticipated as the project is located within a developed roadway with existing vehicular traffic, and no vegetation removal would result from the project. However, indirect noise impacts may occur to migratory and nesting birds, including southern California rufous-crowned sparrow and Bell's sage sparrow, if they are nesting in the adjacent habitat should construction occur during the general avian breeding season (February 1 to September 15). These species are protected by the California Fish and Game Code Section 3503.5, and impacts to nesting individuals would need to be avoided. Measures to avoid impacts to nesting and migratory birds are described below.

AMM-BIO-2: Migratory and Nesting Birds

Construction should be conducted outside the nesting season, which is generally defined as January 15 to August 31. If construction must take place during the nesting season, a qualified biologist shall perform a pre-construction survey for nesting birds. The nesting bird survey shall occur no more than seven days prior to the start of construction. Additionally, raptors (birds of prey) are known to begin nest building in January or February. If construction 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 a qualified biologist until a qualified biologist has verified that the young have fledged or the nest has otherwise become inactive.

5.3 Aquatic Resources

The project would avoid direct impacts to potentially jurisdictional non-wetland waters by avoiding the culverts underlying the roadways. However, the project has potential to result in indirect impacts to potential jurisdictional resources occurring adjacent to the project site. Measures to avoid indirect impacts to potential jurisdictional resources are described below.

AMM-BIO-3: Aquatic Resources

To avoid indirect impacts to potentially jurisdictional features, best management practices, such as the use of silt fences, fiber rolls, and/or gravel bags, should be implemented. No equipment maintenance or fueling should be performed within or near the non-vegetated channel where petroleum products or other pollutants from the equipment may enter this area.

If you have any questions or concerns about this project, please call me at (619) 308-9333 extension 198.

Sincerely,

Chelsea Polevy

Chelsea Polevy
Biologist

CAP:jg

cc: Gustavo Gomez, Eastern Municipal Water District

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ATTACHMENTS

ATTACHMENT 1

Sensitive Plant Species Observed or with the Potential to Occur

Attachment 1 Sensitive Plant Species Observed or with the Potential to Occur									
Major Plant Group	Family	Scientific Name/Common Name	Federal Status	State Status	CNPS Rare Plant Rank	Western Riverside	Habitat Preference/Requirements	Potential to Occur On-Site	Basis for Determination of Occurrence Potential
Angiosperms: Monocots	Liliaceae / Lily Family	*Calochortus weedii* var. *intermedius* / intermediate mariposa lily			1B.2	MSHCP	Perennial herb (bulbiferous); chaparral, coastal scrub, valley and foothill grassland; calcareous; rocky; blooms May-July; elevation between 345 and 2,805 feet.	Unexpected	This species has no potential to occur within the developed roadway within the project site and has low potential to occur in flat-topped buckwheat scrub and riversidean sage scrub habitat adjacent to the project site, outside of the impact areas. One extant record exists for this species within one mile of the survey area.
Angiosperms: Monocots	Poaceae (Gramineae) / Grass Family	*Orcuttia californica* / California Orcutt grass	FE	SE	1B.1	NE, MSHCP, 6.1.3	Annual herb; vernal pools; blooms April–August; elevation 50–2,200 feet.	Unexpected	This species was not observed and is not expected to occur due to lack of suitable vernal pool habitat within or adjacent to the project site. One extant record exists for this species within one mile of the survey area.
Angiosperms: Eudicots	Polygonaceae / Buckwheat Family	*Chorizanthe parryi* var. *parryi* / Parry's spineflower, Parry's spine flower**			1B.1	MSHCP	Annual herb; chaparral, cismontane woodland, coastal scrub, valley and foothill grassland; openings, rocky (sometimes), sandy (sometimes); blooms April-June; elevation between 900 and 4,000 feet.	Unexpected	This species has no potential to occur within the developed roadway within the project site. Though the Riversidean sage scrub adjacent to the project site contains suitable habitat for this species, it consists of a revegetation slope that was historically graded and therefore has a low potential to support this species. Three extant records exist for this species within one mile of the survey area.

Attachment 1 Sensitive Plant Species Observed or with the Potential to Occur									
Major Plant Group	Family	Scientific Name/Common Name	Federal Status	State Status	CNPS Rare Plant Rank	Western Riverside	Habitat Preference/Requirements	Potential to Occur On-Site	Basis for Determination of Occurrence Potential
Angiosperms: Eudicots	Polygonaceae / Buckwheat Family	*Chorizanthe polygonoides* var. *longispina* / long-spined spineflower, long-spined spine flower**			1B.2	MSHCP	Annual herb; clay soils; openings in chaparral, coastal sage scrub, near vernal pools and montane meadows, April–July; elevation 100–5,000 feet.	Unexpected	This species has no potential to occur within the developed roadway within the project site. Though the Riversidean sage scrub adjacent to the project site contains suitable habitat for this species, it consists of a revegetation slope that was historically graded and therefore has a low potential to support this species. Five extant records exist for this species within one mile of the survey area.

NOTE: Scientific and common names were primarily derived from Jepson eFlora (Jepson Flora Project 2020). Common names denoted with ** are from Western Riverside County Regional Conservation Authority 2003. Federal and state listing status is based on California Department of Fish and Wildlife, Natural Diversity Database (CDFW) 2022a.

STATUS CODES

Federal Status

FE = Listed as endangered by the federal government

State Status

SE = Listed as endangered by the state of California

California Native Plant Society (CNPS): California Rare Plant Ranks (CRPR)

1B = Species rare, threatened, or endangered in California and elsewhere. These species are eligible for state listing.

0.1 = Species seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat).

0.2 = Species fairly threatened in California (20-80% occurrences threatened; moderate degree and immediacy of threat).

Western Riverside

MSHCP = Western Riverside County Multiple Species Habitat Conservation Plan covered species.

6.1.3 = Species subject to survey requirements and avoidance measures in Section 6.1.3, Protection of Narrow Endemic Plant Species.

NE = Plant species that are highly restricted by their habitat affinities, edaphic requirements or other ecological factors, and for which specific conservation measures have been identified in Section 6.1.3 of the MSHCP.

ATTACHMENT 2

Sensitive Wildlife Species Occurring or with the Potential to Occur

Attachment 2 Sensitive Wildlife Species Occurring or with the Potential to Occur								
Major Wildlife Group	Family	Scientific Name / Common Name	Federal Status	State Status	Western Riverside	Habitat Preference / Requirements	Potential to Occur On-Site	Basis for Determination of Occurrence Potential
Invertebrates	Nymphalidae / Brush-footed Butterflies	*Euphydryas editha quino* / Quino checkerspot	FE		MSHCP	Open, dry areas in foothills, mesas, lake margins. Larval host plant *Plantago erecta*. Adult emergence mid-January through April.	Unexpected	This species was not observed and has no potential to occur within the developed roadway. Furthermore, this species is not anticipated to occur adjacent to project site due to lack of suitable open, native habitats. The flat-topped buckwheat scrub occurs in a disturbed roadside that appears to have been repeatedly cleared for fuel management, and the Riversidean sage scrub consists of a small revegetation slope that is not anticipated to support larval host plants and bounded by urban/developed land and lack connectivity to open space areas with suitable habitats. Four extant records exist for this species within one mile of the survey area.
Amphibians	Pelobatidae / Spadefoot Toads	*Spea hammondii* / western spadefoot		SSC	MSHCP	Vernal pools, floodplains, and alkali flats within areas of open vegetation.	Unexpected	This species was not observed and is not expected to occur due to lack of suitable vernal pool, foodplain, and alkali flats habitat. One extant record exists for this species within one mile of the survey area.

Attachment 2 Sensitive Wildlife Species Occurring or with the Potential to Occur								
Major Wildlife Group	Family	Scientific Name / Common Name	Federal Status	State Status	Western Riverside	Habitat Preference / Requirements	Potential to Occur On-Site	Basis for Determination of Occurrence Potential
Reptiles	Teiidae / Whiptail Lizards	*Aspidoscelis hyperythra beldingi* [=*Cnemidophorus hyperythrus*] / Belding's orange-throated whiptail		WL	MSHCP	Chaparral, coastal sage scrub with coarse sandy soils and scattered brush.	Unexpected	This species has no potential to occur within the project site and has low potential to occur in flat-topped buckwheat scrub and Riversidean sage scrub habitat adjacent to the project site, outside of the impact areas. The scrub habitat is limited to small, isolated patches bounded by urban/developed land and lacks connectivity to open space areas with suitable habitats. One extant record exists for this species within one mile of the survey area.
Birds	Strigidae / Typical Owls	*Athene cunicularia* / burrowing owl		SSC	MSHCP, 6.3.2	Grassland, agricultural land, coastal dunes. Require rodent burrows. Declining resident.	Unexpected	No western burrowing owl individuals, potential burrows, or any sign of western burrowing owl activity were detected during the survey, and none are expected to nest within or immediately adjacent to the project site due to the extensive urban development associated with the roadways and private residences and lack of suitable burrows or burrow surrogates.

Attachment 2 Sensitive Wildlife Species Occurring or with the Potential to Occur								
Major Wildlife Group	Family	Scientific Name / Common Name	Federal Status	State Status	Western Riverside	Habitat Preference / Requirements	Potential to Occur On-Site	Basis for Determination of Occurrence Potential
Birds	Vireonidae / Vireos	*Vireo bellii pusillus* / least Bell's vireo	FE	SCE	MSHCP, 6.1.2	Willow riparian woodlands. Summer resident.	Unexpected	This species has no potential to occur within the project site and has low potential to occur in southern riparian woodland habitat adjacent to the project site, outside of the impact areas. The southern riparian woodland is limited to small, isolated patches that are completely bounded by urban/developed land and lacks connectivity to suitable riparian habitat. Two extant records exist for this species approximately one mile east of the survey area, though are separated from the project vicinity by Interstate 215 and high-density residential development.
Mammals	Heteromyidae / Pocket Mice & Kangaroo Rats	*Chaetodipus fallax fallax* / northwestern San Diego pocket mouse		SSC	MSHCP	San Diego County west of mountains in sparse, disturbed coastal sage scrub or grasslands with sandy soils.	Unexpected	This species has no potential to occur within the project site and has low potential to occur in flat-topped buckwheat scrub and Riversidean sage scrub habitat adjacent to the project site, outside of the impact areas. The scrub habitat is limited to small, isolated patches bounded by urban/developed land and lacks connectivity to open space areas with suitable habitats. One extant record exists for this species within one mile of the survey area.

Attachment 2 Sensitive Wildlife Species Occurring or with the Potential to Occur								
Major Wildlife Group	Family	Scientific Name / Common Name	Federal Status	State Status	Western Riverside	Habitat Preference / Requirements	Potential to Occur On-Site	Basis for Determination of Occurrence Potential
Mammals	Heteromyidae / Pocket Mice & Kangaroo Rats	*Dipodomys stephensi* / Stephens' kangaroo rat	FT	SCT	MSHCP, SKRHCP	Grassland, open areas.	Unexpected	This species was not observed and is not expected to occur due to lack of suitable open grassland habitat within or adjacent to the project site. Two extant records exist for this species within one mile of the survey area.

I= Introduced species

NOTE: Zoological nomenclature for invertebrates is in accordance with the NatureServe 2021 and Evans 2008; for fish with NatureServe 2021; for reptiles and amphibians with Crother et. al (2017); for birds with Chesser et al. 2021; for mammals with Bradley et al. (2014), American Society of Mammalogists 2021. Determination of the potential occurrence for listed, sensitive, or noteworthy species is based upon known ranges and habitat preferences for species follows Nature Festivals of San Diego County 2002, Evans 2008, Jennings and Hayes 1994, Unitt 2004, Tremor et. al. 2017, and Western Bat Working Group 2017. Federal and state listing status is based on California Department of Fish and Wildlife, Natural Diversity Database (CDFW) 2022.

STATUS CODES

Federal Status

FE = Listed as endangered by the federal government

FT = Listed as threatened by the federal government

State Status

SCE = State candidate for listing as Endangered

SCT = State candidate for listing as Threatened

SSC = California Department of Fish and Wildlife species of special concern

WL = California Department of Fish and Wildlife watch list species

Western Riverside

MSHCP = Western Riverside County Multiple Species Habitat Conservation Prlan covered species

6.1.2 = Species subject to survey requirements and avoidance and minimization measures in Section 6.1.2, Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools of the MSHCP

6.3.2 = Species subject to survey requirements and avoidance measures in Section 6.3.2, Additional Survey Needs and Procedures of the MSHCP

APPENDIX C

Archaeological Resources Survey Report

November 29, 2022

Mr. Joe Broadhead
Principal Water Resource Specialist
Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572-8300

Reference: Archaeological Resources Survey Report for the Los Alamos Hills Water System Project (RECON Number 9878-9)

Dear Mr. Broadhead:

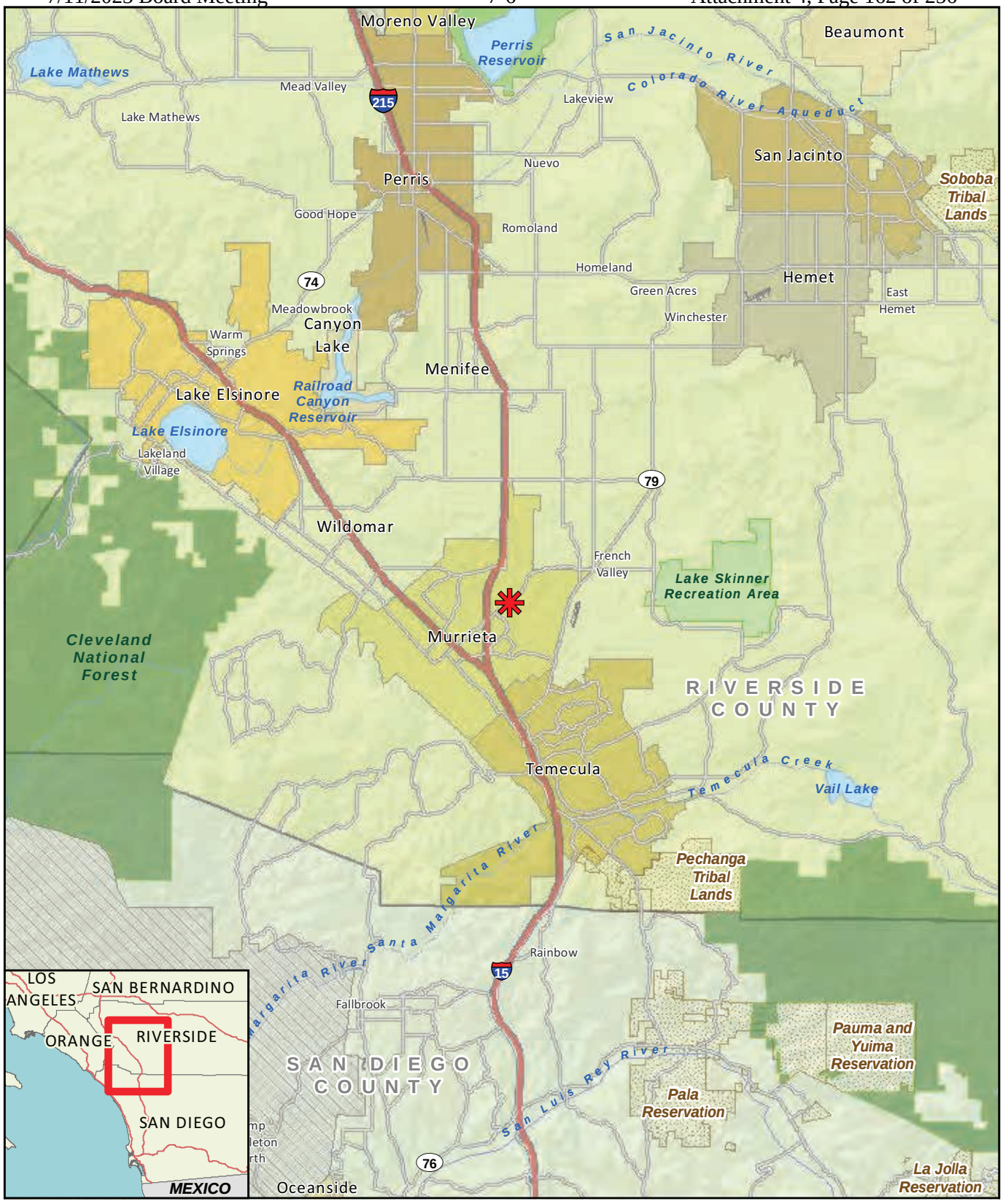
This letter details the results of an archaeological resources survey conducted for the Los Alamos Hills Water System Project (proposed project). RECON Environmental, Inc. (RECON) conducted background research, reviewed historic aerial photographs, and completed a pedestrian survey of the project area. This letter report has been prepared to provide necessary information to identify adverse impacts to potentially significant cultural resources by implementation of the proposed project.

PROJECT LOCATION AND DESCRIPTION

The project consists of the installation of a pipeline loop within existing city streets to provide imported water services to a residential area that currently relies on private wells for potable water. Pipe size would vary, with diameters ranging from 8-inch to 12-inch at approximately 4 to 7 feet in depth. The total length of the proposed loop pipeline is approximately 10,685 linear feet (approximately 2 miles). The following are the pipeline segments that make up the proposed project:

- Los Alamos Road 12-inch pipe, Celia Road to Mason Avenue (approximately 3,350 linear feet)
- Celia Road 8-inch pipe, Mary Place to Mason Road (approximately 2,000 linear feet)
- Mason Road 8-inch pipe, Mary Place to Los Alamos Road (approximately 1,260 linear feet)
- Mary Place 8-inch pipe, Celia Road to Mason Avenue (approximately 3,400 linear feet)
- Ruth Ellen Way 12-inch pipe, Los Alamos Road to the northern property line of Rail Ranch Elementary School (approximately 675 linear feet)

The project site is located in the city of Murrieta, California (Figure 1). Regional access to the project site is provided via Interstate 215 (I-215), located approximately 0.45 mile to the east, and local access is provided via I-215 and east on Los Alamos Road. The project site is in the U.S. Geological Survey Murrieta quadrangle, Township 7 South, Range 3 West (Figure 2). All pipeline segments would be constructed within the existing easements and rights-of-way. The project area is comprised of paved and unpaved ground, either bare or with existing and disturbed vegetation, within existing easements and rights-of-way along Los Alamos Road, Mason Avenue, Mary Place, Celia Road, and Ruth Ellen Way (Figure 3). The project is generally bounded by commercial development and undeveloped lots to the north, residential development to the south, residential and commercial development to the west, and undeveloped lots to the east. The area of potential effect (APE) is 9.0 acres.



Project Location

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FIGURE 1
Regional Location

Map Source: 2022, 7.5-Minute topographic map series, Murrieta quadrangle, 1979, T07S R03W

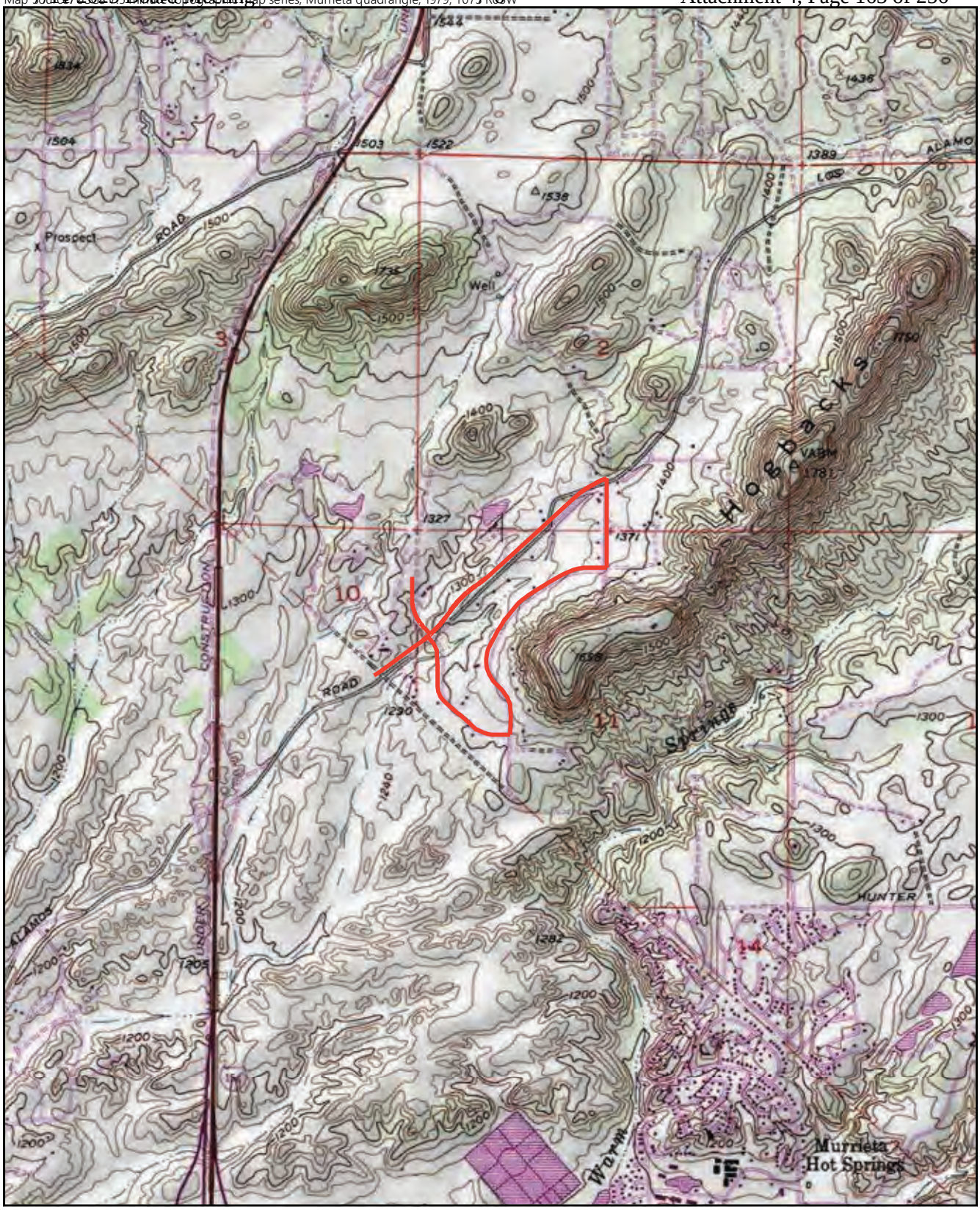

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FIGURE 2
Project Location on USGS Map

FIGURE 3
Project Location on Aerial Photograph

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METHODS

In order to determine if this project will adversely impact significant cultural resources, background research, a review of historic aerial photographs, and an on-foot survey was completed by RECON archaeologist Nathanial Yerka on November 14, 2022. Prior to the survey, a records search of the five pipeline alignments was requested from the Eastern Information Center (EIC) to identify any previously recorded cultural resources located within a one-mile radius of the project area. In addition, a letter was sent on September 22, 2022 to the Native American Heritage Commission (NAHC) requesting a search of their Sacred Lands File to identify spiritually significant and/or sacred sites or traditional use areas in the project vicinity (Attachment 1). The NAHC was also asked to provide a list of local Native American tribes, bands, or individuals that may have concerns or interests regarding cultural resources potentially occurring within the area of potential effect.

The primary goal of this survey was to determine (1) if there are previously unrecorded cultural resources present, and if so, document the resources' locations and what they consist of and (2) to update conditions of previously recorded cultural resources. The project area was inspected for evidence of archaeological materials such as flaked and ground stone tools or fragments, ceramics, milling features, and human remains. Survey transects were concentrated on the sides of the paved roadways, as well as on the open areas of the unpaved roadways, since this approach offered the most ground visibility.

RESULTS OF RECORDS SEARCH

The records search results from the EIC indicate that 57 investigations have been conducted and 33 resources have been recorded within one mile of the project area (Confidential Attachment 1). Of the 33 resources, 2 are historic foundations, 1 trash scatter, 1 single-family property, 2 historic-era isolated artifacts, 21 prehistoric resources, and 6 prehistoric isolated artifacts. Prehistoric resources include bedrock milling features, lithic scatters, ground stone scatters, and faunal remains (Table 1). Of these, 8 investigations and 2 resources (P-33-0293953 and P-33-006237) cross the project area. A response was received from the NAHC on November 3, 2022 indicating that their Sacred Lands File search results were positive (see Attachment 1).

Table 1
Cultural Resources Recorded within One-Mile of the Project Area

Primary #	Trinomial #	Period	Site Type	Recording Events	Notes
P-33-000637	CA-RIV-000637	Prehistoric	Lithic scatter	1973 (J. Humbert, S. Hammond, C.E.F.U.)	-
P-33-000638	CA-RIV-000638	Prehistoric	Bedrock milling; lithic, ground stone scatter	1973 (J. Humbert, S. Hammond, n/a)	-
P-33-001002	CA-RIV-001002	Prehistoric	Lithic scatter	1972 (B. Bettinger, n/a); 1998 (Chris Drover, Craig Lambert, David Smith, n/a)	-
P-33-001005	CA-RIV-001005	Prehistoric	Bedrock milling; lithic, ground stone scatter, faunal remains	1972 (B. Bettinger, n/a); 1998 (Chris Drover, Craig Lambert, David Smith, n/a)	-
P-33-001007	CA-RIV-001007	Prehistoric	Bedrock milling	1972 (B. Bettinger, n/a)	-
P-33-001008	CA-RIV-001008	Prehistoric	Bedrock milling; lithic, ground stone scatter, faunal remains	1972 (B. Bettinger, n/a); 1978 (J. Baldwin, n/a); 1991 (J. Keller, n/a); 2001 (Craig E. Lambert, The Keith Companies, Inc.)	-

Table 1 Cultural Resources Recorded within One-Mile of the Project Area					
Primary #	Trinomial #	Period	Site Type	Recording Events	Notes
P-33-001009	CA-RIV-001009	Prehistoric	Bedrock milling	1972 (B. Bettinger, n/a)	-
P-33-001010	CA-RIV-001010	Prehistoric	Lithic, ground stone scatter	1972 (B. Bettinger, n/a); 1983 (M. Desautels, K. Henriksen, n/a)	-
P-33-001062	CA-RIV-001062	Prehistoric	Lithic, ground stone scatter; faunal remains	1976 (Eastvold, n/a); 1991 (J. Keller, Jean A. Keller); 2001 (Craig E. Lambert, The Keith Companies Inc.)	-
P-33-001360	CA-RIV-001360	Prehistoric	Isolate: metate	1976 (M Morin, W Waldron); 1998 (Chris Drover, Craig Lambert and David Smith)	-
P-33-001361	CA-RIV-001361	Prehistoric	Bedrock milling	1976 (Hildebrand); 1998 (Chris Drover, Craig Lambert and David Smith)	-
P-33-001362	CA-RIV-001362	Prehistoric	Bedrock milling	1976 (Hildebrand)	-
P-33-002081	CA-RIV-002081	Prehistoric	Ground stone scatter	1981 (L.L. Bowles)	-
P-33-003056	CA-RIV-003056	Prehistoric	Bedrock milling; lithic, ground stone scatter	1987 (Victor C. de Munk, Archaeological Research Unit, UC Riverside, CA.); 1992 (Ron Bissell and Ken Becker, RMW Paleo Associates, Inc., Mission Viejo, CA.); 1999 (Robbins-Wade, Affinis, El Cajon, CA.)	-
P-33-004104	CA-RIV-004104	Prehistoric	Lithic, ground stone scatter	1990 (C.E. Drover and D.M. Smith, Christopher Drover 13522 Malena Dr. Tustin, CA 92680)	-
P-33-006237*	**-**	**Historic**	**Homestead**	**1983 (J. Oxedine, Riv. Co. Hist. Comm.); 1995 (Janet Tearnen, Historic Resources Consultant)**	**James Place, demolished**
P-33-007450	-	Historic	Single family property	1983 (J. Oxendine, Riverside County Historical Comm.); 2005 (R. Alter, K. Crawford, S. Moomjian, Archaeos)	George Hind Property
P-33-009703	CA-RIV-006469	Prehistoric	Bedrock milling	2000 (Jean A. Keller, Cultural Resources Consultant)	-
P-33-009704	CA-RIV-006470	Prehistoric	Bedrock milling	2000 (Jean A. Keller, Cultural Resources Consultant)	-
P-33-009705	CA-RIV-006471	Prehistoric	Bedrock milling	2000 (Jean A. Keller, Cultural Resources Consultant)	-
P-33-011239	-	Prehistoric	Lithic scatter	2001 (CW Bouscaren, MG Espinoza, K. A. Hintzman, LSA Associates, Inc.)	-
P-33-011240	-	Historic	Foundations, trash scatter	2001 (CW Bouscaren, MG Espinoza, K. A. Hintzman, LSA, Assoc., Inc)	-
P-33-012771	-	Prehistoric	Isolate: manos	1981 (Bowles)	-
P-33-012772	-	Prehistoric	Isolate: chopper	1980 (C.E. Drover)	-
P-33-013304	CA-RIV-007405	Prehistoric	Bedrock milling; lithic, ground stone scatter	2004 (Sal Boites, CRM TECH)	-

Table 1 Cultural Resources Recorded within One-Mile of the Project Area					
Primary #	Trinomial #	Period	Site Type	Recording Events	Notes
P-33-013397	-	Prehistoric	Isolate: mano	2013 (Claire Fritz and Patricia Tuck, LSA Associates)	-
P-33-013398	-	Prehistoric	Isolate: mano	2004 (Clarie Frtiz and Patricia Tuck, LSA Associates)	-
P-33-013840	CA-RIV-007566	Prehistoric	Lithic quarry	2004 (Gillean, William R., L&L Environmental, Inc.)	-
P-33-013976	-	Prehistoric	Isolate: blade	1666 (Ballester, Daniel, CRM Tech)	-
P-33-015315	CA-RIV-008084	Historic	Trash scatter	2006 (Jones, J. E., M. Knypstra, and J. Meliska, Statistical Research, Inc.)	-
P-33-015316	CA-RIV-008085	Prehistoric	Bedrock milling	2006 (Jones, J. E., M. Knypstra, and J. Meliska, Statistical Research, Inc.)	-
P-33-015317	CA-RIV-008086	Historic	Foundations	2006 (Jones, J. E., M. Knypstra, and J. Meliska, Statistical Research, Inc.)	-
P-33-015318	-	Historic	Isolate: tin can	2006 (Jones, J. Elliott, M. Knypstra, and J. Meliska, Statistical Research, Inc.); 2012 (K. Lindgren, ECORP Consulting, Inc.)	-
P-33-021031	-	Historic	Isolate: metal can	2012 (AECOM, AECOM); 2013 (B Lichtenstein and K Moslak, Applied Earthworks Inc)	-
P-33-023953*	**-**	**Historic**	**Roadway**	**2014 (Josh Smallwood, Applied Earth Works, Inc.); 2015 (Wilson, Stacie and Jill Gibson, AECOM)**	**Los Alamos Road**
Bold = Previously recorded cultural resources mapped within the project area.					

P-33-023953 is a 6.33-mile segment of Los Alamos Road recorded in 2014. The alignment for Los Alamos Road historically extended between Jefferson Avenue on the west end and Winchester Road (State Route 79) on the east end. It was declared a public highway in 1891 and started as a 60-foot standard width dirt road. The western portion of the roadway was paved circa 1987 and the portion east of Warm Springs Creek was still a graded dirt road in 1994. A 0.5-mile segment east of Briggs Road has been removed and landscaped. The roadway has been recommended not eligible under the National Register of Historic Places (NRHP) and under the California Register of Historical Resources (CRHR) because the road was not a primary route across the region like, e.g., the highly used Winchester, Washington, Murrieta Hot Springs, and Benton Roads were (Gousha Company as seen in Smallwood 2014). The roadway also does not qualify under the criteria for historic designation per the City of Murrieta's Municipal Code.

P-33-006237 was recorded in 1995 as James Place, a single-family residence with associated outbuildings. The recorded outbuildings include a barn, a stone masonry barbecue with picnic table, a storage shed, and a grain storage tower. The circa 1915 one-story wood-framed residence was recommended as potentially significant under criterion C/3 as an example of rural vernacular residential architecture during the Anglo farming period; however, the addition of two rooms and severe fire damage resulted in poor integrity and a recommendation of not significant for the NRHP or CRHR. A 1995 summary report of the measured drawings and photographic documentation by Janet L. Tearnen and Andrea Urbas was included in the records search data. This report was completed prior to the demolition of the residence and outbuildings (Tearnen and Urbas 1995).

RECON reviewed historic aerial photographs from 1938, 1967, 1978, and 1985. The 1938 photograph exhibits Los Alamos Road surrounded by agricultural fields and undeveloped lands; none of the other four roads were noted. The northern extent of the road within the project area followed a slightly different alignment in 1938. The 1967 photograph displays the same alignment for Los Alamos Road and the addition of Mason Avenue. By 1978, Mary Place and Celia Road are present, and the alignment of Los Alamos is straightened to its current alignment. The 1978 photograph also exhibits various small residential plots along the southern side of Los Alamos Road, the western side of Mason Avenue, and the northern side of Mary Place. Ruth Ellen Way is also present in 1978 as a small dirt road. The latter road follows the current width and alignment by the 2002 photograph. The residential plots along the southern side of Los Alamos Road, the western side of Mason Avenue, and the northern side of Mary Place, increase by the 1985 photograph (Nationwide Environmental Title Research LLC 2022).

RESULTS OF SURVEY

RECON archaeologist Nathanial Yerka conducted a pedestrian survey of the project APE on November 14, 2022 and did not identify any cultural resources. Ruth Ellen Way, Los Alamos Road, and Mason Avenue are paved roadways. Ruth Ellen Way exhibits shoulder pathways made of imported base material with white vinyl fencing on the east side of the roadway, and concrete sidewalks on the west side (Photograph 1). A municipal park is on the east side of Ruth Ellen Way while an elementary school field as well as residential housing is to the west. The shoulder along the north side of the northeastern segment of Los Alamos has an improved pathway with white vinyl fencing along the length of the park while the southern shoulder is unimproved and fronts residential lots. Northeast of the park, the road shoulders of Los Alamos Road are unimproved and the area consists of agricultural fields on the north side and residential lots on the south side (Photograph 2). Mason Avenue has disturbed soft shoulders with an improved horse trail along the east side. Mary Place and Celia Road are unpaved dirt roads with ornamental vegetation along their shoulders (Photograph 3). Celia Road has been built at a higher elevation than the surrounding house pads and has improved ditches on either side of the roadway for drainage (Photograph 4). The entire project area has been disturbed in the past by grading and maintenance of the roads.

REGULATORY CONTEXT

California Environmental Quality Act

The regulatory framework and methods for determining impacts on cultural resources include compliance with California Environmental Quality Act (CEQA) requirements as defined in Section 15064.5 of the CEQA Guidelines, Determining the Significance of Impacts to Archaeological and Historical Resources. These guidelines require the identification of cultural resources that could be affected by the proposed project, the evaluation of the significance of such resources, an assessment of the proposed project impacts on significant resources, and a development of a research design and data recovery program to avoid or address adverse effects to significant resources. Significant resources, also called historical resources, are those cultural resources (whether prehistoric or historic) that have been evaluated and determined to be eligible for listing in the California Register of Historical Resources.

PHOTOGRAPH 1
Overview of Ruth Ellen Way, Looking North from
Los Alamos Road Intersection

PHOTOGRAPH 2
Overview of Los Alamos Road, Looking Northeast from Eastern Boundary of
Los Alamos Hills Sports Park Equestrian Trail

PHOTOGRAPH 3
End of Pavement at the Intersection of Mason Avenue and Mary Place, Looking West from East Side of Mason Avenue where it Transitions to Los Alamos Heights Road

PHOTOGRAPH 4
Overview of Celia Road with Drainage Ditch, Looking South from Celia Road, Approximately 500 feet South of Intersection with Los Alamos Road

According to CEQA Section 15064.5(a), a historical resource includes the following:

1. A resource listed in, or determined to be eligible for listing on, the California Register of Historical Resources.
2. A resource included in the local register.
3. A resource which an agency determines to be historically significant. Generally a resource shall be considered to be "historically significant," if the resource meets the criteria for listing on the California Register of Historical Places (Public Resources Code Section 5024.1 Title 14 California Code of Regulations, Section 4852) including the following:
    A. Is associated with events that have made a significant contribution to the broad patterns of California's history or cultural heritage;
    B. Is associated with the lives of persons important in our past;
    C. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of an important creative individual, or possesses high artistic values; or
    D. Has yielded, or maybe likely to yield, information important to prehistory or history.
4. The fact that a resource is not listed in or determined to be eligible for listing in the California Register of Historical Resources or a local register does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code Sections 5020.1(j) or 5024.1.

A resource must meet one of the above criteria and must have integrity; that is, it must evoke the resource's period of significance or, in the case of criterion D, it may be disturbed, but it must retain enough intact and undisturbed deposits to make a meaningful data contribution to regional research issues.

MANAGEMENT RECOMMENDATIONS

No significant prehistoric or historic cultural resources were observed during the survey. The records search identified two cultural resources within the project area. P-33-006237 was recorded in 1995 as a single-family residence with associated outbuildings but the property has since been demolished; therefore, it is not eligible for listing on the CRHR. Los Alamos Road (P-33-023953) has been present since 1891 but it does not meet the criteria for listing on the CRHR. Because none of these resources are significant, the project would not result in an adverse impact to known cultural resources. Because the entire project area has been disturbed by past development and the possibility of buried significant cultural resources being present within the project area is considered low, RECON does not recommend any further cultural resources work for this project.

Please call me at (619) 308-9333 extension 133 you have any questions or concerns about this project.

Sincerely,

Carmen Zepeda-Herman

Carmen Zepeda-Herman, RPA
Archaeology Project Director

CZH:sh

Attachments

REFERENCES CITED

Nationwide Environmental Title Research, LLC (NETR)
2022 Historic Aerials. http://www.historicaerials.com/. Accessed on November 14, 2022.

Smallwood, Josh
2014 Site form for P-33-023953. On file at the Eastern Information Center, University of California at Riverside.

Tearnen, Janet, and Andrea Urbas
1995 Summary Report for Measured Drawings and Photographic Documentation of the James Place, 37201 Los Alamos Road, Murrieta, California. On file at the Eastern Information Center, University of California at Riverside.

ATTACHMENT 1

NAHC Correspondence

STATE OF CALIFORNIA Gavin Newsom, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

November 3, 2022

Carmen Zepeda-Herman
RECON Environmental, Inc.

Via Email to: czepeda@reconenvironmental.com

Re: Los Alamos Hills Pipelines Project, Riverside County

Dear Ms. Zepeda-Herman:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information submitted for the above referenced project. The results were positive. Please contact the Pechanga Band of Indians on the attached list for information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. A SLF search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with a project's geographic area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites, such as the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center for the presence of recorded archaeological sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Riverside County
11/3/2022

Agua Caliente Band of Cahuilla Indians
Reid Milanovich, Chairperson
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6800
Fax: (760) 699-6919
laviles@aguacaliente.net

Agua Caliente Band of Cahuilla Indians
Patricia Garcia-Plotkin, Director
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6907
Fax: (760) 699-6924
ACBCI-THPO@aguacaliente.net

Augustine Band of Cahuilla Mission Indians
Amanda Vance, Chairperson
84-001 Avenue 54 — Cahuilla
Coachella, CA, 92236
Phone: (760) 398 - 4722
Fax: (760) 369-7161
hhaines@augustinetribe.com

Cabazon Band of Mission Indians
Doug Welmas, Chairperson
84-245 Indio Springs Parkway — Cahuilla
Indio, CA, 92203
Phone: (760) 342 - 2593
Fax: (760) 347-7880
jstapp@cabazonindians-nsn.gov

Cahuilla Band of Indians
Daniel Salgado, Chairperson
52701 U.S. Highway 371 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 5549
Fax: (951) 763-2808
Chairman@cahuilla.net

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos — Juaneno
San Juan Capisttrano, CA, 92675
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Joyce Perry, Tribal Manager
4955 Paseo Segovia — Juaneno
Irvine, CA, 92603
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation 84A
Heidi Lucero, Chairperson
31411-A La Matanza Street — Juaneno
San Juan Capistrano, CA, 92675
Phone: (562) 879 - 2884
hllucero105@gmail.com

La Jolla Band of Luiseno Indians
Norma Contreras, Chairperson
22000 Highway 76 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 3771

Los Coyotes Band of Cahuilla and Cupeño Indians
Ray Chapparosa, Chairperson
P.O. Box 189 — Cahuilla
Warner Springs, CA, 92086-0189
Phone: (760) 782 - 0711
Fax: (760) 782-0712

Morongo Band of Mission Indians
Ann Brierty, THPO
12700 Pumarra Road — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 755 - 5259
Fax: (951) 572-6004
abrierty@morongo-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Los Alamos Hills Pipelines Project, Riverside County.

Native American Heritage Commission
Native American Contact List
Riverside County
11/3/2022

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Road — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 755 - 5110
Fax: (951) 755-5177
abrierty@morongo-nsn.gov

Pala Band of Mission Indians
Shasta Gaughen, Tribal Historic Preservation Officer
PMB 50, 35008 Pala Temecula Rd. — Cupeno, Luiseno
Pala, CA, 92059
Phone: (760) 891 - 3515
Fax: (760) 742-3189
sgaughen@palatribe.com

Pauma Band of Luiseno Indians
Temet Aguilar, Chairperson
P.O. Box 369 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 1289
Fax: (760) 742-3422
bennaecalac@aol.com

Pechanga Band of Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6000
Fax: (951) 695-1778
epreston@pechanga-nsn.gov

Pechanga Band of Indians
Paul Macarro, Cultural Resources Coordinator
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6306
Fax: (951) 506-9491
pmacarro@pechanga-nsn.gov

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

Quechan Tribe of the Fort Yuma Reservation
Manfred Scott, Acting Chairman Kw'ts'an Cultural Committee
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com

Ramona Band of Cahuilla
Joseph Hamilton, Chairperson
P.O. Box 391670 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
admin@ramona-nsn.gov

Ramona Band of Cahuilla
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P. O. Box 391670 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
jgomez@ramona-nsn.gov

Rincon Band of Luiseno Indians
Bo Mazzetti, Chairperson
One Government Center Lane — Luiseno
Valley Center, CA, 92082
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bomazzetti@aol.com

Rincon Band of Luiseno Indians
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One Government Center Lane — Luiseno
Valley Center, CA, 92082
Phone: (760) 297 - 2635
crd@rincon-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Los Alamos Hills Pipelines Project, Riverside County.

Native American Heritage Commission
Native American Contact List
Riverside County
11/3/2022

Santa Rosa Band of Cahuilla Indians
Lovina Redner, Tribal Chair
P.O. Box 391820 Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
lsaul@santarosa-nsn.gov

Soboba Band of Luiseno Indians
Isaiah Vivanco, Chairperson
P. O. Box 487 Cahuilla
San Jacinto, CA, 92581 Luiseno
Phone: (951) 654 - 5544
Fax: (951) 654-4198
ivivanco@soboba-nsn.gov

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 Cahuilla
San Jacinto, CA, 92581 Luiseno
Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Torres-Martinez Desert Cahuilla Indians
Cultural Committee,
P.O. Box 1160 Cahuilla
Thermal, CA, 92274
Phone: (760) 397 - 0300
Fax: (760) 397-8146
Cultural-Committee@torresmartinez-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Los Alamos Hills Pipelines Project, Riverside County.

CONFIDENTIAL ATTACHMENT 1

Records Search

Not for Public Review

APPENDIX D

Geotechnical Report

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Sciences
Inspection & Testing Services

GEOTECHNICAL INVESTIGATION REPORT

EMWD LOS ALAMOS HILLS PIPELINE PROJECT

City of Murrieta, Riverside County, California

CONVERSE PROJECT NO. 22-81-144-02

Prepared For:

WEBB ASSOCIATES
3788 McCray Street
Riverside, CA 92506

Presented By:

CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

November 28, 2022

November 28, 2022

Mr. Bradley Sackett, PE
Senior Engineer
Webb Associates
3788 McCray Street
Riverside, CA 92506

Subject: **GEOTECHNICAL INVESTIGATION REPORT**
EMWD LOS ALAMOS HILLS PIPELINE PROJECT
City of Murrieta, Riverside County, California
Converse Project No. 22-81-144-02

Dear Mr. Sackett:

Converse Consultants (Converse) is pleased to submit this Geotechnical Investigation Report for the EMWD Los Alamos Hills Project, located in the City of Murrieta, Riverside County, California. This report was prepared in accordance with our proposal dated June 21, 2022, and your Single-Project Subconsultant Agreement (Project Code: 2022-0143) dated August 22, 2022.

Based upon our field investigation, laboratory data, and analyses, the proposed project is considered feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into the design and construction of the project.

We appreciate the opportunity to be of service to Webb Associates (WEBB) and the Eastern Municipal Water District (EMWD). Should you have any questions, please do not hesitate to contact us at 909-474-2847.

CONVERSE CONSULTANTS

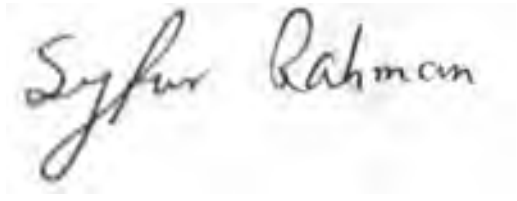
Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

Dist.: 1-Electronic pdf/Addressee
HSQ/RG/MS/CN/SR/kvg

PROFESSIONAL CERTIFICATION

This report has been prepared by the following professionals whose seals and signatures appear herein.

The findings, recommendations, specifications and professional opinions contained in this report were prepared in accordance with the generally accepted professional engineering and engineering geologic principle and practice in this area of Southern California. We make no other warranty, either expressed or implied.



Sk Syfur Rahman, PhD, EIT
Senior Staff Engineer

Stephen McPherson
Staff Geologist

Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

TABLE OF CONTENTS

FIGURES

Following Page No.

TABLES

Page No.

APPENDICES

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed by Converse for the EMWD Los Alamos Hills project, located in the City of Murrieta, Riverside County, California. The pipeline alignments are shown in Figure No. 1, *Approximate Alignments Locations Map*.

The purpose of this investigation is to determine the nature and engineering properties of the subsurface soils, and to provide preliminary design and construction recommendations for the project.

This report is prepared for the project described herein and is intended for use solely by WEBB and EMWD and their authorized agents for design purposes. It should not be used as a bidding document but may be made available to the potential contractors for information on factual data only. For bidding purposes, the contractors should be responsible for making their own interpretation of the data contained in this report.

2.0 PROJECT DESCRIPTION

The pipeline alignments being considered for the project are summarized in the following table.

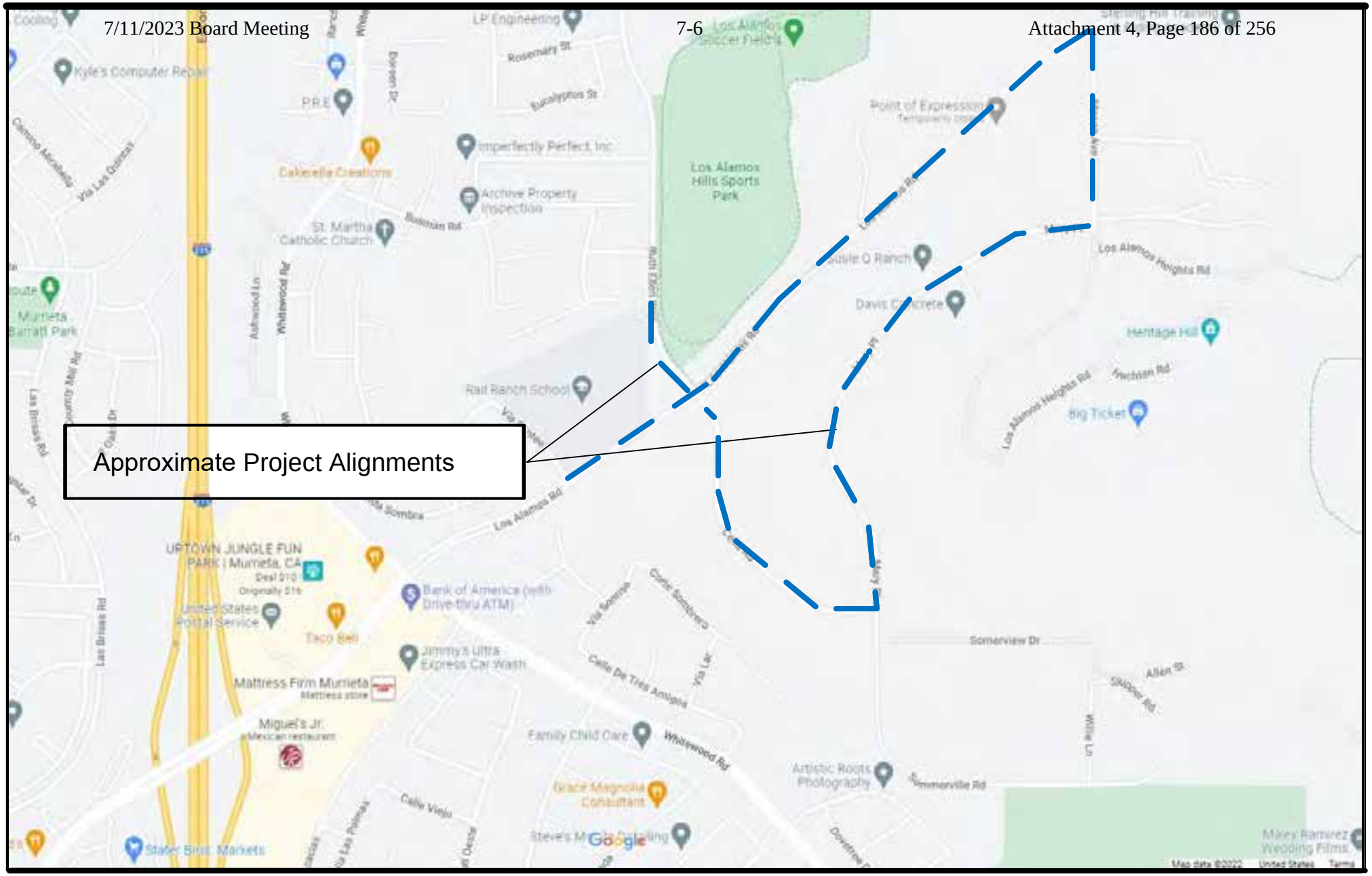
Table No. 1, Summary of the Pipelines Alignments

Site/Alignment	Location From	Location to	Approximate Distance (feet)
Los Alamos Road	Via Santee	Mason Avenue	4,280
Ruth Ellen Way	Approximately 670 feet North of Los Alamos Road	Los Alamos Road	670
Celia Road	Los Alamos Road	Mary Place	2,010
Mary Place	Celia Road	Mason Avenue	4,000
Mason Avenue	Mary Place	Los Alamos Road	1,240
Note: For each alignment location, refer to Figure No. 1, *Approximate Alignments Locations Map.*			

The available project plans are preliminary; therefore, project information described herein is subject to change if the project plans change.

3.0 ALIGNMENTS CONDITIONS

The surface conditions of the major streets along the pipeline alignments are described below.



Project: EMWD Los Alamos Hills
Location: City of Murrieta, Riverside County, California

Approximate Alignments Locations Map

Project No.
22-81-144-02

For: Webb Associates

Converse Consultants

Figure No.
1

a. <u>Ruth Ellen Way: Beginning of Pipeline Alignments on Ruth Ellen Way to Los Alamos Road (approx. 670 feet)</u>

- Bounded on west by Rail Ranch School Yard and drainage basin and to the east by a slope to Los Alamos Hills Sports Park.
- Paved road with single lane in each direction with shoulders, but no center painted median. The width of the road is approximately 45 feet.
- Sidewalk on west side of road with horse trail on the east.
- Overhanging streetlights.
- Parking lane on west side.
- Light traffic was observed.
- Professional traffic control was required.
- Drilling required the closure of the shoulder.
- Refer to Photograph Nos. 1 and 2.

Photograph No. 1: Ruth Ellen Way at beginning of pipeline alignments BH-02, facing south.

Photograph No. 2: Ruth Ellen Way at Los Alamos Road, facing north.

b. *Los Alamos Road: Via Santee to Mason Avenue (approx. 4,280 feet)*

- Bounded on the north from Via Santee to Ruth Ellen Way by Rail Ranch School and a residential property, then from Ruth Ellen Way by Los Alamos Hills Sports Park for approximately 1,100 feet, then residential horse property to Mason Avenue, and the south by residential horse property and vacant land.
- Paved road with 1 lane in each direction with no shoulders or center painted median. The width of the road is approximately 30 feet.
- No overhead utilities or streetlights.
- Moderate traffic was observed.
- Professional traffic control was required.
- Drilling required the closure of the shoulder.
- Refer to Photograph Nos. 3 through 6.

Photograph No. 3: Los Alamos Road at Ruth Ellen Way, facing northeast.

Photograph No. 4: Los Alamos Road BH-15, facing southwest.

Photograph No. 5: Los Alamos Road (BH-13), facing northeast.

Photograph No. 6: Los Alamos Road at Mason Avenue (BH-12), facing southwest.

c. <u>Celia Road: Los Alamos Road to Mary Place (approx. 2.020 feet)</u>

- Bounded on both sides by residential horse property.
- Graded dirt road with single lane in each direction. The width of the road is approximately 25 feet.
- The posted speed limit sign is 15 miles per hour (mph).
- No overhead or overhanging streetlights.
- Light traffic was observed.

- No professional traffic control was required.
- Drilling required the closure of the shoulder.
- Refer to Photograph Nos. 7 and 8.

Photograph No. 7: Celia Road at Los Alamos Road BH-03, facing southeast.

Photograph No. 8: Celia Road at Mary Place BH-05, facing west.

d. <u>Mary Place: Celia Road to Mason Avenue (approx. 4,000 feet)</u>

- Bounded on both sides by residential horse property.

- Graded dirt road with single lane in each direction. The width of the road is approximately 25 feet.
- Light traffic was observed.
- No professional traffic control required.
- Drilling required the closure of the shoulder.
- Refer to Photograph Nos. 9 through 10.

Photograph No. 9: Mary Place at Celia Road, facing north.

Photograph No. 10: Mary Place (BH-07), facing southwest.

e. *Mason Avenue: Los Alamos Road to Mary Place (approx. 1,240 feet)*

- Bounded on both sides by residential horse property.

- Heavily worn paved road with single lane in each direction. The width of the road is approximately 15 feet.
- The posted speed limit sign is 10 miles per hour (mph).
- No overhead utilities or streetlights.
- Light traffic was observed.
- No professional traffic control was required.
- Drilling required the closure of the shoulder.
- Refer Photograph Nos. 11 and 12.

Photograph No. 11: Mason Avenue at Los Alamos Road, facing south.

Photograph No. 12: Mason Avenue at Mary Place, facing north.

4.0 SCOPE OF WORK

The scope of this investigation included project set-up, subsurface exploration, laboratory testing, engineering analysis, and preparation of this report, as described in the following sections.

4.1 Document Review

We reviewed the following available documents.

- Reports and data provided by WEBB and EMWD.
- Desktop study report prepared by Converse Consultants, dated June 1, 2022.
- Regional and local geology literature and maps.
- Flood hazards maps.
- Arial photos.
- Faulting and seismicity, and any other documents that pertain to the sites or the vicinity.
- Groundwater data.

4.2 Project Set-up

The project set-up consisted of the following tasks.

- Prepared a boring locations map and submitted it to Brad Sackett with WEBB for review and approval.
- Conducted alignments reconnaissance and marked the borings at locations approved by Bradly Sackett with WEBB.
- Obtained encroachment permit to drill along Los Alamos Road and Ruth Ellen Way from the Public Works & Engineering Department, City of Murrieta.
- Prepared required traffic control plans.
- Notified Underground Service Alert (USA) at least 48 hours prior to drilling to clear the boring locations of any conflict with existing underground utilities.
- Engaged a California-licensed driller to drill exploratory borings.
- Engaged a Professional Traffic Control company.

4.3 Subsurface Exploration

Fifteen exploratory borings (BH-01 through BH-15) were drilled on October 18, and October 19, 2022, along the pipeline alignments to investigate subsurface conditions. The borings were drilled using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers. The details of borings are presented in the following table.

Table No. 2, Summary of the Borings

Boring No.	Location	Boring Depth (ft, bgs)		Groundwater Depth (ft, bgs)	Date Completed
		Proposed	Completed		
BH-01	Los Alamos Road[t]	10.0	5.0**	N/E	10/19/2022
BH-02	Ruth Ellen Way[t]	10.0	11.5	N/E	10/19/2022
BH-03	Celia Road	10.0	11.4	N/E	10/18/2021
BH-04	Celia Road	10.0	6.0*	N/E	10/18/2021
BH-05	Celia Road	10.0	6.5*	N/E	10/18/2021
BH-06	Mary Place	10.0	10.3	N/E	10/18/2021
BH-07	Mary Place	10.0	10.3	N/E	10/18/2021
BH-08	Mary Place	10.0	10.6	N/E	10/18/2021
BH-09	Mary Place	10.0	11.5	N/E	10/18/2021
BH-10	Mason Avenue[v]	10.0	10.5	N/E	10/18/2021
BH-11	Mason Avenue[v]	10.0	10.9	N/E	10/18/2021
BH-12	Los Alamos Road[t]	10.0	10.3	N/E	10/19/2022
BH-13	Los Alamos Road[t]	10.0	11.3	N/E	10/19/2022
BH-14	Los Alamos Road[t]	10.0	10.4	N/E	10/19/2022
BH-15	Los Alamos Road[t]	10.0	10.2	N/E	10/19/2022

Note: - NE = not encountered.
*Refusal due to large concentration of aggregate.
**Refusal due to potential utility conflict.
t=pavement cored, and core replaced with Pro Select Anchoring Adhesive and dyed black to match road surface.
v= pavement drilled directly into and patched with cold patch asphalt concrete.

The approximate locations of the borings are shown on Figure Nos. 2a and 2b, *Approximate Boring Locations Map*. A detailed discussion of the subsurface exploration is presented in Appendix A, *Field Exploration*.

4.4 Laboratory Testing

Representative soil samples were tested in the laboratory to aid in the soils classification and to evaluate the relevant engineering properties of the soil. These tests included the following.

- *In*-situ moisture contents and dry densities (ASTM D2216 and ASTM D2937)
- Sand Equivalent (ASTM D2419)
- Soil corrosivity (California Tests 643, 422, and 417)

Project: EMWD Los Alamos Hills
Location: City of Murietta, Riverside County, California

For: Webb Associates

Approximate Boring Locations Map

Project No.
22-81-144-02

Converse Consultants

Figure No.
2a

Project: EMWD Los Alamos Hills
Location: City of Murietta, Riverside County, California

For: Webb Associates

Approximate Boring Locations Map

Project No.
22-81-144-02

Converse Consultants

Figure No.
2b

- Grain size distribution (ASTM D6913)
- Maximum dry density and optimum-moisture content (ASTM D1557)
- Direct shear (ASTM D3080)

For *in-situ* moisture and dry density data, see the Logs of Boring in Appendix A, *Field Exploration*. For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program.*

4.5 Analysis and Report Preparation

Data obtained from the field exploration and laboratory testing program was compiled and evaluated. Geotechnical analyses of the compiled data were performed, and this report was prepared to present our findings, conclusions, and recommendations for the project.

5.0 SURFACE AND SUBSURFACE CONDITIONS

A general description of the surface and subsurface conditions, various materials and groundwater conditions encountered at each location during our field exploration is discussed below.

5.1 Existing Pavement Sections

The measured pavement thicknesses at each boring location are listed in the following table.

Table No. 3, Existing Pavement Sections

Boring No.	Street/Location	Asphalt Concrete Thickness (in.)	Aggregate Base Thickness (in.)
BH-01	Los Alamos Road	6.0	4.0
BH-02	Ruth Ellen Way	4.0	9.0
BH-03*	Celia Road	N/A	N/A
BH-04*	Celia Road	N/A	N/A
BH-05*	Celia Road	N/A	N/A
BH-06*	Mary Place	N/A	N/A
BH-07*	Mary Place	N/A	N/A
BH-08*	Mary Place	N/A	N/A
BH-09*	Mary Place	N/A	N/A
BH-10	Mason Avenue	4.0	3.0
BH-11	Mason Avenue	2.0	4.0

Boring No.	Street/Location	Asphalt Concrete Thickness (in.)	Aggregate Base Thickness (in.)
BH-12	Los Alamos Road	5.0	2.0
BH-13	Los Alamos Road	5.0	4.0
BH-14	Los Alamos Road	5.0	4.0
BH-15	Los Alamos Road	5.0	2.0

Note:
For location of the borings, see Figure Nos. 2a and 2b, *Approximate Boring Locations Map* and *Table No. 2, Summary of Boring.*
*Drilled on dirt.

For a detailed description of the subsurface materials encountered in the exploratory borings, see Drawings No. A-2 through A-16, *Logs of Borings,* in Appendix A, *Field Exploration.*

5.2 Subsurface Profile

The subsurface profile to the depths of borings is described below.

Undocumented Artificial Fill: Undocumented artificial fill was encountered in all borings from the surface and below the asphalt concrete to a depth ranging from 0.5 feet to 5.0 feet below ground surface (bgs). Based on the exploratory borings and laboratory test results, the subsurface fill soils consist primarily of a mixture of sand, silt, occasional gravel and cobbles. Scattered to little gravel up to 3 inch in largest dimension, and scattered cobbles up to 8 inches in maximum dimension were observed in the borings.

Alluvium: The alluvium was encountered in all borings below the undocumented artificial fill at depths ranging from 0.5 to 5.0 feet bgs. Based on the exploratory borings and laboratory test results, the subsurface alluvium soils consist primarily of a mixture of sand, silt, clay, occasional gravel and occasional cobble. Scattered to little gravel up to 3 inch in largest dimension were observed in the borings.

5.3 Groundwater

Groundwater was not encountered during the field investigation.

Current and historical groundwater data was reviewed near the proposed pipeline alignment. Results from the searches are provided below.

The State Water Resources Control Board's GeoTracker Database (SWRCB, 2022) was reviewed for current and historic groundwater level data within a 1.0-mile radius of the

project area. Data from that search is listed below.

- Shell Service Station (Site No. T0606581892), located approximately 2,800 feet southwest of the project area, reported groundwater at depths ranging from approximately 17.63 to 40.12 feet bgs between 2003 and 2009.
- Mobil Service Station (Site No. T0606540445), located approximately 4,330 feet southwest of the project area, reported groundwater at depths ranging from approximately 54.84 to 58.01 feet bgs between 2005 and 2009.
- Las Brisas Cleaners (Site No. SL0607300208) located approximately 4,500 feet southwest of the project area, reported groundwater at depths ranging from approximately 55.07 to 62.10 feet bgs between 2006 and 2011.

The National Water Information System (USGS, 2022) was reviewed for current and historical groundwater data from sites within an approximately 1.0-mile radius of the pipeline alignments and the results of that search are included below.

Table No. 4, Summary of USGS Groundwater Depth Data

Site Number	Location	Groundwater Depth Range (ft. bgs)	Date Range
333501117095201	Los Alamos Road along pipeline alignment 1	30.00	1968
333512117092701	Approximately 4,500 feet east of Mason Avenue	43.00	1968
333440117101501	Approximately 300 feet west of Celia Road	12.00	1968
333442117102101	Approximately 800 feet west of the intersection of Los Alamos and Celia Road	34.00	1968
333533117091401	Approximately 2,500 feet northeast of the intersection of Los Alamos and Mason Avenue	23.00	1968
333529117093401	Approximately 2,300 feet northeast of the intersection of Los Alamos and Mason Avenue	10.00	1968
333532117100001	Approximately 2,800 feet northwest of the intersection of Los Alamos and Mason Avenue	9.00	1968
333506117102901	Approximately 2,000 feet northwest of the beginning of pipeline Alignment on Ruth Ellen Way	6.00	1968

The California Department of Water Resources database (DWR, 2022) was reviewed for historical groundwater data from sites within a 1.0-mile radius of the project site. No site, which is not listed above, with groundwater data was found within a 1.0-mile radius of the project site.

Historically high groundwater along the pipeline alignments is not known with certainty but is anticipated to be deeper than approximately 6.0 feet bgs. However, under certain conditions the groundwater may be at or above ground surface, e.g., periods of flooding or proximity to a stream.

It should be noted that the groundwater levels could vary depending upon the seasonal precipitation and possible groundwater pumping activity in the alignment vicinity. Shallow perched groundwater may be present locally, particularly following precipitation.

5.4 Excavatability

The subsurface soil materials are expected to be excavatable by conventional heavy-duty earth moving and trenching equipment. Excavation will likely be difficult where concentration of gravel and cobbles are encountered.

The phrase “conventional heavy-duty excavation equipment” is intended to include commonly used equipment such as excavators and trenching machines. It does not include hydraulic hammers (“breakers”), jackhammers, blasting, or other specialized equipment and techniques used to excavate hard earth materials. Selection of an appropriate excavation equipment model should be done by an experienced earthwork contractor and may require test excavations in representative areas.

5.5 Subsurface Variations

Based on results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface conditions within the pipeline alignments should be anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations.

6.0 ENGINEERING GEOLOGY

The regional and local geology are discussed in the following subsections.

6.1 Regional Geology

The pipeline alignments are located within the northern Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province consists of a series of northwest-trending mountain ranges and valleys bounded on the north by the San Bernardino and San Gabriel Mountains, on the west by the Los Angeles Basin, and on the south by the Pacific Ocean.

The province is a seismically active region characterized by a series of northwest-trending strike-slip faults. The most prominent of the nearby fault zones include the San Jacinto, Cucamonga, and San Andreas Fault Zones, all of which have been known to be active during Quaternary time.

Topography within the province is generally characterized by broad alluvial valleys separated by linear mountain ranges. This northwest-trending linear fabric is created by the regional faulting within the granitic basement rock of the Southern California Batholith. Broad, linear, alluvial valleys have been formed by erosion of these principally granitic mountain ranges.

The project area is located within the Perris Block. The Perris Block is a relatively stable structural block bounded by the active Elsinore and San Jacinto fault zones to the west and east, and the Chino and Temecula basins to the north and south, respectively. The Perris Block has low relief and is roughly rectangular.

6.2 Local Geology

The project area is anticipated to be underlain by Cretaceous age undifferentiated hornblende gabbro (Kgb) to the southwest. The northeastern portion of the project area is anticipated to be underlain by Sandstone, moderately to well indurated, containing scattered cobble to boulder conglomerate (Qps) beds. Bedrock is anticipated to be encountered within the project area.

6.3 Flooding

Review of National Flood Insurance Rate Maps indicate that the pipeline alignments are located within a Flood Hazard Zone "X". The zone “X” is designated as an area with a 0.2 percent annual chance flood hazard. (FEMA, 2008).

7.0 FAULTING AND SEISMICITY

Nearby active faults, seismicity, and their impact on the project area are discussed in the following sections.

7.1 Faulting

The proposed pipeline alignments are situated in a seismically active region. As is the case for most areas of Southern California, ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site. Review of recent seismological and geophysical publications indicates that the seismic hazard for the project is high.

No portion of the project area is located within a currently designated State of California or Riverside County Earthquake Fault Zone (CGS, 2007; Riverside County, 2022). The nearest active fault zone is the Murrieta Hot Springs fault zone approximately 1,400 feet south of the intersection of Celia Road and Mary Place. The nearest fault is the Warm Springs Fault approximately 400 feet south of the intersection of Celia Road and Mary Place. The Elsinore Fault Zone is approximately 2.35 miles southwest of the Celia Road and Mary Place intersection.

The table below summarizes selected data of known faults capable of seismic activity within 100 kilometers of the site. We used the generalized coordinates of 33.5809N, 117.16724W, for the fault table below. The data presented below was calculated using the National Seismic Hazard Maps Database (USGS, 2008) and other published geologic data.

Table No. 5, Summary of Regional Faults

Fault Name and Section	Closest Distance (km)	Slip Sense	Length (km)	Slip Rate (mm/year)	Maximum Magnitude
Elsinore	4.25	strike slip	241	n/a	7.85
San Jacinto	28.96	strike slip	241	n/a	7.88
Chino, alt 2	45.81	strike slip	29	1	6.80
Chino, alt 1	49.97	strike slip	24	1	6.70
Newport Inglewood Connected alt 1	50.25	strike slip	208	1.3	7.50
Newport Inglewood Connected alt 2	50.25	strike slip	208	1.3	7.50
Newport-Inglewood (Offshore)	50.25	strike slip	66	1.5	7.00
S. San Andreas	52.83	strike slip	548	n/a	8.18
Rose Canyon	56.17	strike slip	70	1.5	6.90
Pinto Mtn	66.84	strike slip	74	2.5	7.30
Earthquake Valley	69.93	strike slip	20	2	6.80
Cucamonga	70.91	thrust	28	5	6.70

Fault Name and Section	Closest Distance (km)	Slip Sense	Length (km)	Slip Rate (mm/year)	Maximum Magnitude
Newport-Inglewood, alt 1	71.33	strike slip	65	1	7.20
Puente Hills (Coyote Hills)	73.85	thrust	17	0.7	6.90
Coronado Bank	75.01	strike slip	186	3	7.40
Palos Verdes Connected	75.01	strike slip	285	3	7.70
San Jose	76.43	strike slip	20	0.5	6.70
Palos Verdes	77.38	strike slip	99	3	7.30
Cleghorn	77.39	strike slip	25	3	6.80
Sierra Madre	80.22	reverse	57	2	7.20
Sierra Madre Connected	80.22	reverse	76	2	7.30
Burnt Mtn	81.9	strike slip	21	0.6	6.80
North Frontal (West)	82.2	reverse	50	1	7.20
Eureka Peak	87.21	strike slip	19	0.6	6.70
Puente Hills (Santa Fe Springs)	87.93	thrust	11	0.7	6.70
Helendale-So Lockhart	88.68	strike slip	114	0.6	7.40
North Frontal (East)	90.44	thrust	27	0.5	7.00
Landers	94.87	strike slip	95	0.6	7.40
Clamshell-Sawpit	96.41	reverse	16	0.5	6.70
Lenwood-Lockhart-Old Woman Springs	98.06	strike slip	145	0.9	7.50
Puente Hills (LA)	98.75	thrust	22	0.7	7.00
Raymond	99.88	strike slip	22	1.5	6.80

(Source: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/)

7.2 *CBC Seismic Design Parameters*

Seismic parameters based on the 2022 California Building Code (CBSC, 2022) and ASCE 7-16 are provided in the following table. These parameters were determined using the generalized coordinates (33.5809N, 117.16724W) and the Seismic Design Maps ATC online tool.

Table No. 6, CBC 2022 Seismic Design Parameters

Seismic Parameters	
Site Coordinates	33.5809N, 117.16724W
Site Class	D*
Risk Category	III

Seismic Parameters	
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_s	1.494g
Mapped 1-second Spectral Response Acceleration, S_1	0.558g
Site Coefficient (from Table 11.4-1), F_a	1.0
Site Coefficient (from Table 11.4-2), F_v	1.8
MCE 0.2-sec period Spectral Response Acceleration, S_{MS}	1.494g
MCE 1-second period Spectral Response Acceleration, SM_1	1.004g
Design Spectral Response Acceleration for short period S_{DS}	0.996g
Design Spectral Response Acceleration for 1-second period, S_{D1}	0.670g
Site Modified Maximum Peak Ground Acceleration, PGA_M	0.717g

** Stiff Soil Classification*

7.3 Secondary Effects of Seismic Activity

Generally, in addition to ground shaking, effects of seismic activity on a pipeline or structure may include surface fault rupture, soil liquefaction, and settlement due to earthquake shaking, landslides, lateral spreading, tsunamis, seiches, and flooding due to earthquake-induced dam failure. The site-specific potential for each of these seismic hazards is discussed in the following sections.

Surface Fault Rupture: No portions of the project area are located within a currently designated State of California or Riverside County Earthquake Fault Zone (CGS, 2007; Riverside County, 2022). The potential for surface rupture resulting from the movement of nearby or distant faults is not known with certainty but is considered very low.

Dynamic Settlement (Liquefaction and Dry Seismic Settlement): Liquefaction is defined as the phenomenon in which a soil mass within about the upper 50 feet of the ground surface suffers a substantial reduction in its shear strength, due the development of excess pore pressures. During earthquakes, excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction.

Soil liquefaction occurs during or after strong ground shaking. There are several requirements for liquefaction to occur. They are as follows.

- Soils must be submerged
- Soils must be loose to medium-dense
- Ground motion must be intense
- Duration of shaking must be sufficient for the soils to lose shear resistance

There is a very low risk for liquefaction along Ruth Ellen Way, Los Alamos Road, Mason Avenue and the northeastern section of Mary Place. Celia Road and the southwest section of Mary Place there is no risk for liquefaction. Dynamic settlement should be evaluated with data from the soil borings to be conducted during the geotechnical investigation phase

Landslides and Lateral Spreading: Seismically induced landslides and other slope failures are common occurrences during or after earthquakes in areas of significant relief. No portions of the project area are located within a currently designated State of California or Riverside County Landslide Zone (CGS, 2007; Riverside County, 2022). Seismically induced lateral spreading involves primarily lateral movement of earth materials due to ground shaking. The potential for landslides or lateral spreading at the project area is considered very low.

Tsunamis: Tsunamis are large waves generated in open bodies of water by fault displacement or major ground movement. Due to the inland location of the pipeline alignments, tsunamis are not considered to be a risk.

Seiches: Seiches are large waves generated in enclosed bodies of water in response to ground shaking. There are no enclosed bodies of water near the pipeline alignments. Seiching is not considered to be a risk during construction.

Earthquake-Induced Flooding: Dams or other water-retaining structures may fail as a result of large earthquakes. The pipeline alignments are not located within a designated dam inundation area (DSOD, 2022).

8.0 LABORATORY TEST RESULTS

Results of physical and chemical tests performed for this project are presented below.

8.1 Physical Testing

Physical test results for alignments are presented in the following table. For detailed description of these tests, see Appendix B, *Laboratory Testing Program,* except for the results of in-situ moisture and dry density tests which are presented on the Logs of Borings in Appendix A, *Field Exploration*.

Table No. 7, Physical Properties of Soils

Test	Values				
	Los Alamos BH01, BH-12 to BH-15	Ruth Ellen BH-02	Celia Way BH-03 to BH-05	Mary Place BH-06 to BH-09	Mason BH-10, BH-11
*In-situ Moisture and Dry Density (ASTM D2216 and ASTM D2937)	94 to 135 pcf and 3 to 10 percent	103 to 132 pcf and 9 to 11 percent	90 to 127 pcf and 2 to 23 percent	110 to 138 pcf and 1 to 12 percent	107 to 128 pcf and 5 to 11 percent
Sand Equivalent (ASTM D2419)	21.0 to 34.0	N/T	N/T	23	29
Gran Size Analysis (ASTM D6913)	SM	SM	SM with gravel	SM	SM
Maximum Dry Density and Optimum Moisture Content (ASTM D1557)	131.0 pcf and 4.8 percent	N/T	136.0 pcf and 4.4 percent	135.0 pcf and 7.2 percent	N/T
Direct Shear (ASTM D3080)	C= 200 psf and ϕ = 36	N/T	C= 110 to 400 psf and ϕ= 31 to 41	C= 290 psf and ϕ = 31	C= 250 psf and ϕ = 30

Note:
1.N/T = Not Tested, SM = Silty Sand,
2.*Moisture and dry density for upper 10 feet
3. C = cohesion, ϕ = angle of internal friction

8.2 Chemical Testing - Corrosivity Evaluation

Four representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purposes of these tests were to determine the corrosion potential of soils when placed in contact with common pipe and construction materials. These tests were performed by AP Engineering and Testing, Inc. (Pomona, CA) in accordance with Caltrans Test Methods 643, 422 and 417. The test results are summarized in the following table.

Table No. 8, Summary of Corrosivity Test Results

Boring No.	Street	Depth (feet)	pH	Soluble Sulfates (CA 417) (ppm)	Soluble Chlorides (CA 422) (ppm)	Min. Resistivity (CA 643) (Ohm-cm)
BH-03	Celia Way at Celia Way	5.0-10.0	7.6	35	26	2,107
BH-05	Celia Way at Mary Place	0 – 5.0	7.4	38	27	2,208
BH-08	Mary Place.	5.0 – 10.0	7.4	16	19	10,248
BH-11	Mason Avenue	0.5 – 5.0	7.3	35	24	2,045

9.0 TRENCH BACKFILL RECOMMENDATIONS

Recommendations of backfill for pipe trenching are presented in the following subsections.

9.1 General

Prior to the start of construction, all existing underground utilities and appurtenances should be located within the vicinity of the proposed alignments. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing structures or utilities.

All debris, deleterious material, and surficial soils containing roots and perishable materials should be stripped and removed from the alignments. Deleterious material, including organics, concrete, and debris generated during excavation, should not be placed as fill.

Migration of fines from the surrounding native soils, in the case of water leak from the pipe, must be considered in selecting the gradation of the materials placed within the trench, including bedding, pipe zone and trench zone backfill, as defined in the following sections. Such migration of fines may deteriorate pipe support and may result in settlement/ground loss at the surface.

It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.

Observations and field tests should be performed by the project soils consultant to confirm that the required degree of compaction has been obtained. Where compaction is less than specified, additional compactive effort should be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.

9.2 Pipeline Subgrade Preparation

The final subgrade surface should be level, firm, uniform, free of loose materials, and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles, larger than 3 inches maximum dimension, should be removed from the trench bottom and replaced with compacted on-alignments materials.

Any loose, soft and/or unsuitable materials encountered at the pipe sub-grade should be removed and replaced with an adequate bedding material.

During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

9.3 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 1 foot above the pipe. Pipe bedding should follow EMWD or City of Murrieta Standards, whichever is applicable. Additional information for pipe bedding is provided below.

To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material. The sand equivalents of the tested soils were between 21 and 34. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. The pipe designer should determine if the soils are suitable as pipe bedding material.

The type and thickness of the granular bedding placed underneath and around the pipe, if any, should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe.

Bedding materials should be vibrated in-place to achieve compaction. Care should be taken to densify the bedding material below the springline of the pipe. Prior to placing the pipe bedding material, the pipe subgrade should be uniform and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding

material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

Migration of fines from the surrounding native and/or fill soils must be considered in selecting the gradation of any imported bedding material. We recommend that the pipe bedding material should satisfy the following criteria to protect migration of fine materials.

i. $\frac{D15(F)}{D85(B)} \leq 5$

ii. $\frac{D50(F)}{D50(B)} < 25$

iii. Bedding Materials must have less than 5 percent passing No. 200 sieve (0.0074 mm) to avoid internal movement of fines.

Where,
F = Bedding Material
B = Surrounding Native and/or Fill Soils
*D*15(F) = Particle size through which 15% of bedding material will pass
*D*85(B) = Particle size through which 85% of surrounding soil will pass
*D*50(F) = Particle size through which 50% of bedding material will pass
*D*50(B) = Particle size through which 50% of surrounding soil will pass

If the above criteria do not satisfy, commercially available geofabric used for filtration purposes (such as Mirafi 140N or equivalent) may be wrapped around the bedding material encasing the pipe to separate the bedding material from the surrounding native or fill soils.

9.4 Backfill Materials

No fill should be placed until excavations and/or natural ground preparation have been observed by the geotechnical consultant. Excavated soils should be processed, including removal of roots and debris, removal of oversized particles, mixing, and moisture conditioning, before placing as compacted fill. On-site soils used as fill should meet the following criteria.

- No particles larger than 3 inches in largest dimension.
- Rocks larger than one inch should not be placed within the upper 12 inches of subgrade soils.
- Free of all organic matter, debris, or other deleterious material.
- Expansion index of 30 or less.
- Sand Equivalent greater than 15 (greater than 30 for pipe bedding).
- Contain less than 40 percent fines (passing #200 sieve).

Imported materials, if required, should meet the above criteria prior to being used as compacted fill. Any imported fills should be tested and approved by geotechnical representative prior to delivery to the construction site.

9.5 Compacted Fill Placement

Fill soils should be thoroughly mixed, and moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils and compacted to at least 90 percent of the laboratory maximum dry density.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When work is interrupted by heavy rain, filling operations should not resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

9.6 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. Excavated on-site soils free of oversize particles and deleterious matter may be used to backfill the trench zone. Trench backfill should follow EMWD or City of Murrieta Standards, whichever is applicable. Additional trench backfill recommendations are presented below.

- Trench excavations to receive backfill should be free of trash, debris or other unsatisfactory materials at the time of backfill placement.
- Trench zone backfill should be compacted to at least 90 percent of the laboratory maximum dry density as per ASTM D1557 test method. At least the upper 1 foot of trench backfill underlying pavement should be compacted to at least 95 percent of the laboratory maximum dry density as per ASTM D1557 test method.
- Particles larger than 1 inch should not be placed within 12 inches of the pavement subgrade. No more than 30 percent of the backfill volume should be larger than ¾-inch in the largest dimension. Gravel should be well mixed with finer soil. Rocks larger than 3 inches in the largest dimension should not be placed as trench backfill.
- Trench backfill should be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers or mechanical tampers to achieve the density specified herein. The backfill materials should be brought to within ± 3 percent of optimum moisture content for coarse-grained soil, and between optimum and 2 percent above optimum for fine-grained soil, then placed in horizontal layers. The thickness of uncompacted layers should not exceed 8 inches. Each layer should

be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.

- The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, structures, utilities and completed work.
- The field density of the compacted soil should be measured by the ASTM D1556 (Sand Cone) or ASTM D6938 (Nuclear Gauge) or equivalent.
- Trench backfill should not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations should not resume until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are in compliance with project specifications.

10.0 DESIGN RECOMMENDATIONS

General design recommendations, resistance to lateral loads, pipe design parameters, bearing pressures, and soil corrosivity are discussed in the following subsections.

10.1 General

Where pipes connect to rigid structures and are subjected to significant loads as the backfill is placed to finish grade, we recommend that provisions be incorporated in the design to provide support of these pipes where they exit the structures. Consideration can be given to flexible connections, concrete slurry support beneath the pipes where they exit the structures, overlaying the pipes with a few inches of compressible material, (i.e., Styrofoam, or other materials), or other techniques.

The various design recommendations provided in this section are based on the assumption that the above earthwork recommendations will be implemented.

10.2 Resistance to Lateral Loads

Resistance to lateral loads can be assumed to be provided by passive earth pressures and friction between construction materials and native soils. The resistance to lateral loads were estimated by using on-site native soils strength parameters obtained from laboratory testing. The resistance to lateral loads recommended for use in design of thrust blocks are presented in the following table.

Table No. 9, Resistance to Lateral Loads

Soil Parameters	Value
Passive earth pressure (psf per foot of depth)	250
Maximum allowable bearing pressure against native soils (psf)	2,500
Coefficient of friction between formed concrete and native soils, fs	0.35

10.3 Soil Parameters for Pipe Design

Structural design requires proper evaluation of all possible loads acting on pipe. The stresses and strains induced on buried pipe depend on many factors, including the type of soil, density, bearing pressure, angle of internal friction, coefficient of passive earth pressure, and coefficient of friction at the interface between the backfill and native soils. The recommended values of the various soil parameters for design are provided in the following table.

Table No. 10, Soil Parameters for Pipe Design

Soil Parameters	Value		
	Celia Road	Marry Place	Los Alamos Road
Average compacted fill total unit weight (assuming 92% relative compaction), γ (pcf)	131	133	126
Angle of internal friction of soils, ϕ	31	31	36
Soil cohesion, c (psf)	110	110	200
Coefficient of friction between concrete and native soils, fs	0.35	0.35	0.35
Coefficient of friction between PVC pipe and native soils, fs	0.25	0.25	0.25
Bearing pressure against native soils (psf)	2,500	2,500	2,500
Coefficient of passive earth pressure, Kp	3.12	3.12	3.85
Coefficient of active earth pressure, Ka	0.32	0.32	0.26
Modulus of Soil Reaction E' (psi)	1,500	1,500	1,500

Note
1. Celia Road = BH-03 through BH-05,
2. Marry Place = BH-06 through BH-09,
3. Los Alamos Road = BH-01 and BH-12 through BH-15

10.4 Bearing Pressure for Anchor and Thrust Blocks

An allowable net bearing pressure presented in Table No. 10, *Soil Parameters for Pipe Design* may be used for anchor and thrust block design against alluvial soils. Such thrust blocks should be at least 18 inches wide.

If normal code requirements are applied for design, the above recommended bearing capacity and passive resistances may be increased by 33 percent for short duration loading such as seismic or wind loading.

10.5 Soil Corrosivity

The results of chemical testing of four representative soil samples from the soil borings were evaluated for corrosivity evaluation with respect to common pipe and construction materials such as concrete and steel. The test results are presented in Appendix B, *Laboratory Testing Program,* and are discussed below.

The sulfate content of the sampled soil corresponds to American Concrete Institute (ACI) exposure category S0 for this sulfate concentration (ACI 318-14, Table 19.3.1.1). No concrete type restrictions are specified for exposure category S0 (ACI 318-14, Table 19.3.2.1). A minimum compressive strength of 2,500 psi is recommended.

We anticipate that the pipeline will be exposed to moisture from precipitation and irrigation. Based on the alignments location and the results of chloride testing of the soils, we do not anticipate pipeline will be exposed to external sources of chlorides, such as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-14, Table 19.3.1.1). ACI provides concrete design recommendations in ACI 318-14, Table 19.3.2.1, including a compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent.

According to Romanoff, 1957, the following table provides general guidelines of soil corrosion based on electrical resistivity.

Table No. 11, Correlation Between Resistivity and Corrosion

Soil Resistivity (ohm-cm) per Caltrans CT 643	Corrosivity Category
Over 10,000	Mildly corrosive
2,000 – 10,000	Moderately corrosive
1,000 – 2,000	corrosive
Less than 1,000	Severe corrosive

The minimum electrical resistivities along pipeline alignments when saturated ranged from 2,045 to 10,248 ohm-cm. These values indicate that the tested soils are moderately corrosive to ferrous metals in contact with the soils.

Converse does not practice in the area of corrosion consulting. If needed, a qualified corrosion consultant should provide appropriate corrosion mitigation measures for any ferrous metals in contact with the site soils.

11.0 CONSTRUCTION CONSIDERATIONS

Construction recommendations are presented below.

11.1 General

Prior to the start of construction, all existing underground utilities should be located along the pipeline alignments. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

Vertical braced excavations are feasible along the pipeline alignments. Sloped excavations may not be feasible in locations adjacent to existing utilities (if any).

Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, current amendments, and the Construction Safety Act should be met. The soil exposed in cuts should be observed during excavation by the owner's representative and the competent person employed by the contractor in accordance with regulations. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

11.2 Temporary Sloped Excavations

Temporary open-cut trenches may be constructed in areas not adjacent to existing underground utilities improvements with side slopes as recommended in the table below. Temporary cuts encountering soft and wet fine-grained soils, dry loose, cohesionless soils, or loose fill from trench backfill may have to be constructed at a flatter gradient than presented below.

Table No. 12, Slope Ratios for Temporary Excavations

Soil Type	OSHA Soil Type	Depth of Cut (feet)	Recommended Maximum Slope (Horizontal: Vertical)[1]
Silty Sand with Gravel (SM), Silty Sand (SM), Clay (CL)	C	0-10	1.5:1
		10-20	2:1

[1] Slope ratio is assumed to be constant from top to toe of slope, with level adjacent ground.

For shallow excavations up to 4 feet bgs, slope can be vertical. For steeper temporary construction slopes or deeper excavations, or unstable soil encountered during the excavation, shoring or trench shields should be provided by the contractor as necessary to protect the workers in the excavation.

Surfaces exposed in sloped excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5 feet of the unsupported slope edge. Stockpiled soils with a height higher than 6 feet will require greater distance from trench edges.

11.3 Shoring Design

Temporary shoring will be required where open sloped excavations will not be feasible due to unstable soils or due to nearby existing structures or facilities. Temporary shoring may consist of conventional soldier piles and lagging or sheet piles or any piles selected by contractor. The shoring for the pipe excavations may be laterally supported by walers and cross bracing or may be cantilevered. Drilled excavations for soldier piles will require the use of drilling fluids to prevent caving and to maintain an opened hole for pile installation.

The active earth pressure behind any shoring depends primarily on the allowable movement, type of backfill materials, backfill slopes, wall inclination, surcharges, and any hydrostatic pressures.

The lateral earth pressures to be used in the design of shoring is presented in the following table.

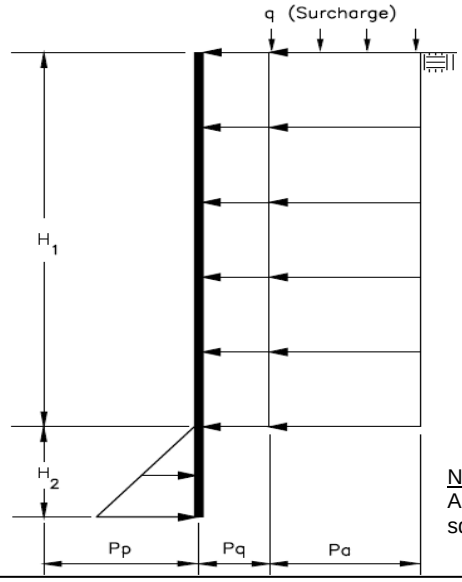
Table No. 13, Lateral Earth Pressures for Temporary Shoring

Lateral Resistance Soil Parameters*	Value
Active Earth Pressure (Braced Shoring) (psf) (A)	30
Active Earth Pressure (Cantilever Shoring) (psf) (B)	46
At-Rest Earth Pressure (Cantilever Shoring) (psf) (C)	68
Passive earth pressure (psf per foot of depth) (D)	250
Maximum allowable bearing pressure against native soils (psf) (E)	2,500
Coefficient of friction between sheet pile and native soils, fs (F)	0.25

* Parameters A through F are used in Figures No. 3 and 4 below.

Restrained (braced) shoring systems should be designed based on Figure No. 3, *Lateral Earth Pressures for Temporary Braced Excavation* to support a uniform rectangular lateral earth pressure.

Figure No. 3, Lateral Earth Pressures for Temporary Braced Excavation



Total Earth Pressure, P

P = Pq + Pa

Pq = 0.5q - incremental surcharge pressure

Pa = (A)H_1 - active earth pressure (Braced walls)

Lateral Pressure Resistance

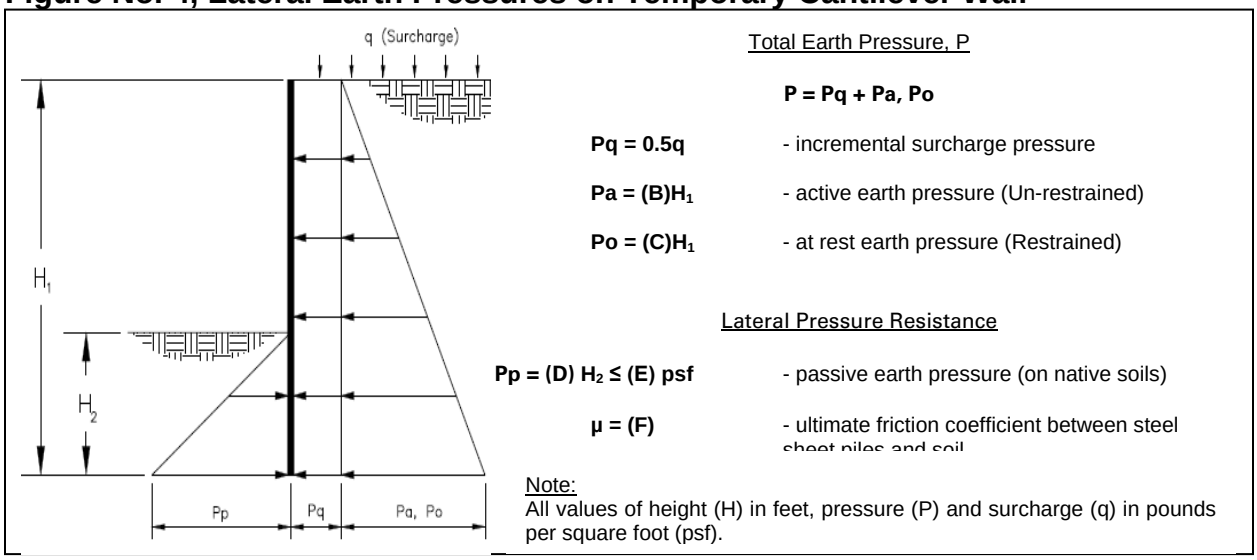
Pp = (D) H_2 ≤ (E) psf - passive earth pressure (on native soils)

μ = (F) - ultimate friction coefficient between steel sheet piles and soil

Note:
All values of height (H) in feet, pressure (P) and surcharge (q) in pounds per square foot (psf).

Unrestrained (cantilever) design of cantilever shoring consisting of soldier piles spaced at least two diameters on-center or sheet piles, can be based on Figure No. 4, *Lateral Earth Pressures on Temporary Cantilever Wall*.

Figure No. 4, Lateral Earth Pressures on Temporary Cantilever Wall



The provided pressures assume no hydrostatic pressures. If hydrostatic pressures are allowed to build up, the incremental earth pressures below the ground-water level should be reduced by 50 percent and added to hydrostatic pressure for total lateral pressure.

Passive resistance includes a safety factor of 1.5. The upper 1 foot for passive resistance should be ignored unless the surface is confined by a pavement or slab.

In addition to the lateral earth pressure, surcharge pressures due to miscellaneous loads, such as soil stockpiles, vehicular traffic or construction equipment located adjacent to the shoring, should be included in the design of the shoring. A uniform lateral pressure of 100 psf should be included in the upper 10 feet of the shoring to account for normal vehicular and construction traffic within 10 feet of the trench excavation. As previously mentioned, all shoring should be designed and installed in accordance with state and federal safety regulations.

The contractor should have provisions for soldier pile and sheet pile removal. All voids resulting from removal of shoring should be filled. The method for filling voids should be selected by the contractor, depending on construction conditions, void dimensions and available materials. The acceptable materials, in general, should be non-deleterious, and able to flow into the voids created by shoring removal (e.g., concrete slurry, “pea” gravel, etc.).

Excavations for the proposed pipeline should not extend below a 1:1 horizontal: vertical (H:V) plane extending from the bottom of any existing structures, utility lines or streets.

Any proposed excavation should not cause loss of bearing and/or lateral supports of the existing utilities or streets.

If the excavation extends below a 1:1 (H: V) plane extending from the bottom of the existing structures, utility lines or streets, a maximum of 10 feet of slope face parallel to the existing improvement should be exposed at a time to reduce the potential for instability. Backfill should be accomplished in the shortest period of time and in alternating sections.

12.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by WEBB, EMWD and their authorized agents, to assist in the design and construction of the proposed project. Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

Converse Consultants is not responsible or liable for any claims or damages associated with interpretation of available information provided to others. Field exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed, and the recommendations of this report are modified or verified in writing. In addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. Converse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

As the project evolves, continued consultation and construction monitoring by a qualified geotechnical consultant should be considered an extension of geotechnical investigation services performed to date. The geotechnical consultant should review plans and specifications to verify that the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this report are valid. Where significant design changes occur, Converse may be required to augment or modify the recommendations presented herein. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and, possibly, modified recommendations.

Design recommendations given in this report are based on the assumption that the recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

13.0 REFERENCES

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Appendix A

Field Exploration

APPENDIX A

FIELD EXPLORATION

Our field investigation included alignments reconnaissance and a subsurface exploration program consisting of drilling soil borings. During the alignment reconnaissance, the surface conditions were noted, and the borings were marked at locations reviewed and approved by Brad Sackett with WEBB. The approximate boring locations were established in the field with reference to existing streets and other visible features. The locations should be considered accurate only to the degree implied by the method used. Permit was obtained from the City of Murrieta prior to the drilling on Los Alamos Road and Ruth Ellen Way, no permit was required for the remaining borehole locations.

Fifteen exploratory borings (BH-01 through BH-15) were drilled on October 18 and October 19, 2022, along the pipeline alignments to investigate the subsurface conditions. BH-01 was terminated due to possible utility conflict, BH-04, and BH-05 were terminated due to large concentration of aggregate. The borings details are presented in the following table.

Table No. A-1, Summary of Boring Information

Boring No.	Location	Boring Depth (ft, bgs)		Groundwater Depth (ft, bgs)	Date Completed
		Proposed	Completed		
BH-01	Los Alamos Road[t]	10.0	5.0**	N/E	10/19/2022
BH-02	Ruth Ellen Way[t]	10.0	11.5	N/E	10/19/2022
BH-03	Celia Road	10.0	11.4	N/E	10/18/2021
BH-04	Celia Road	10.0	6.0*	N/E	10/18/2021
BH-05	Celia Road	10.0	6.5*	N/E	10/18/2021
BH-06	Mary Place	10.0	10.3	N/E	10/18/2021
BH-07	Mary Place	10.0	10.3	N/E	10/18/2021
BH-08	Mary Place	10.0	10.6	N/E	10/18/2021
BH-09	Mary Place	10.0	11.5	N/E	10/18/2021
BH-10	Mason Avenue[v]	10.0	10.5	N/E	10/18/2021
BH-11	Mason Avenue[v]	10.0	10.9	N/E	10/18/2021
BH-12	Los Alamos Road[t]	10.0	10.3	N/E	10/19/2022
BH-13	Los Alamos Road[t]	10.0	11.3	N/E	10/19/2022
BH-14	Los Alamos Road[t]	10.0	10.4	N/E	10/19/2022

Boring No.	Location	Boring Depth (ft, bgs)		Groundwater Depth (ft, bgs)	Date Completed
		Proposed	Completed		
BH-15	Los Alamos Road[t]	10.0	10.2	N/E	10/19/2022

Note: - NE = not encountered.
* Refusal due to large concentration of aggregate.
**Refusal due to potential utility conflict
t=pavement cored, and core replaced with Pro Select Anchoring Adhesive and dyed black to match road surface.
v= pavement drilled directly into and patched with cold patch asphalt concrete.

The boring locations on Los Alamos Road and Ruth Ellen Way (BH-01, BH-02 and BH-12 through BH-15) were cored with coring machine, the remainder of the locations were not cored. Borings were then drilled using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers. Encountered materials were continuously logged by a Converse geologist and classified in the field by visual classification in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches. Blow counts at each sample interval are presented on the boring logs. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Bulk samples of typical soil types were also obtained.

Following the completion of logging and sampling, the borings were backfilled with soil cuttings mixed with cement and compacted by pushing down with an auger using the drill rig weight.

Borings (BH-03 through BH-09) were backfilled with soil cuttings and compacted by pushing down with an auger using drill rig weight due to the borings being located on dirt road. The surface of the borings that penetrated Los Alamos Road and Ruth Ellen Way (BH-01, BH-02 and BH-12 through BH-15), were patched with cored asphalt concrete piece and glued into place with Pro Select Anchoring Adhesive and dyed black. The borings that penetrated Mason Avenue (BH-10 and BH-11), were patched with cold patch asphalt.

If construction is delayed, the surface may settle over time. We recommend the owner monitor the boring locations and backfill any depressions that might occur or provide protection around the boring locations to prevent trip and fall injuries from occurring near the area of any potential settlement.

For a key to soil symbols and terminology used in the boring logs, refer to Drawing No. A-1a through A-1c, *Unified Soil Classification and Key to Boring Log Symbols*. For logs of borings, see Drawing Nos. A-2 through A-16, *Logs of Borings*.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE			GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE			SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435)
CL	Collapse Potential (ASTM D 4546)
CP	Compaction Curve (ASTM D 1557)
CR	Corrosion, Sulfates, Chlorides (CTM 643-99; 417; 422)
CU	Consolidated Undrained Triaxial (ASTM D 4767)
DS	Direct Shear (ASTM D 3080)
EI	Expansion Index (ASTM D 4829)
M	Moisture Content (ASTM D 2216)
OC	Organic Content (ASTM D 2974)
P	Permeablility (ASTM D 2434)
PA	Particle Size Analysis (ASTM D 6913 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (ASTM D 4318)
PL	Point Load Index (ASTM D 5731)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301)
SE	Sand Equivalent (ASTM D 2419)
SG	Specific Gravity (ASTM D 854)
SW	Swell Potential (ASTM D 4546)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166)
	Unconfined Compression - Rock (ASTM D 7012)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850) Unit
UW	Weight (ASTM D 2937)

BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE 2.42" I.D. sampler (CMS).
- DRIVE SAMPLE No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING
- Dist. Disturbed

DRILLING METHOD SYMBOLS

Auger Drilling | Mud Rotary Drilling | Dynamic Cone or Hand Driven | Diamond Core

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Project Name: EMWD Los Alamos Hills Pipeline
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing **A-1a**

CONSISTENCY OF COHESIVE SOILS						
Descriptor	**Unconfined Compressive Strength (tsf)**	**SPT Blow Counts**	**Pocket Penetrometer (tsf)**	**CA Sampler**	**Torvane (tsf)**	**Field Approximation**
Very Soft	<0.25	< 2	<0.25	<3	<0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	2 - 4	0.25 - 0.50	3 - 6	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	5 - 8	0.50 - 1.0	7 - 12	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	9 - 15	1.0 - 2.0	13 - 25	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	16 - 30	2.0 - 4.0	26 - 50	1.0 - 2.0	Readily indented by thumbnail
Hard	>4.0	>30	>4.0	>50	>2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS		
Descriptor	**SPT N_{60}- Value (blows / foot)**	**CA Sampler**
Very Loose	<4	<5
Loose	4- 10	5 - 12
Medium Dense	11 - 30	13 - 35
Dense	31 - 50	36 - 60
Very Dense	>50	>60

MOISTURE	
Descriptor	**Criteria**
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OF PROPORTION OF SOILS	
Descriptor	**Criteria**
Trace (fine)/ Scattered (coarse)	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE		
Descriptor		**Size**
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS	
Descriptor	**Criteria**
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION/ Induration	
Descriptor	**Criteria**
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptions and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Project Name: EMWD Los Alamos Hills Pipeline
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-223-02**

Drawing No. **A-1b**

LEGEND OF ROCK MATERIALS


IGNEOUS ROCK


SEDIMENTARY ROCK


METAMORPHIC ROCK

BEDDING SPACING

Description	Thickness/Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in - 1 ft
Thinly Bedded	1 in - 4 in
Very Thinly Bedded	1/4 in - 1 in
Laminated	Less than 1/4 in

WEATHERING DESCRIPTORS FOR INTACT ROCK

	Diagnostic Features					
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering and Grain Boundary Conditions	Texture and Leaching		
Description	Body of Rock	Fracture Surfaces		Texture	Leaching	General Characteristics
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull	Minor to complete discoloration or oxidation of most surfaces	No visible separation, intact (tight)	Preserved	Minor leaching of some soluble minerals	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty"; feldspar crystals are "cloudy"	All fracture surfaces are discolored or oxidized	Partial separation of boundaries visible	Generally preserved	Soluble minerals may be mostly leached	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation, grain boundary conditions	All fracture surfaces are discolored or oxidized; surfaces friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Texture altered by chemical disintegration (hydration, argillation)	Leaching of soluble minerals may be complete	Dull sound when struck with hammer; usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures or veinlets. Rock is significantly weakened.
Decomposed	Discolored of oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay		Complete separation of grain boundaries (disaggregated)	Resembles a soil; partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes".

PERCENT CORE RECOVERY (REC)

$$\frac{\Sigma \text{ Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

ROCK QUALITY DESIGNATION (RQD)

$$\frac{\Sigma \text{ Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100$$

RQD* indicates soundness criteria not met.

ROCK HARDNESS

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with a pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily with a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

Fracturing Spacing

Description	Observed Fracture Density
Unfractured	No fractures
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments

REFERENCE Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010).

BEDROCK CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Project Name: EMWD Los Alamos Hills Pipeline
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. A-1c

Log of Boring No. BH-01-Los Alamos Road

Date Drilled: 10/19/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1274 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		6" CEMENT CONCRETE/ 4" AGGREGATE BASE						SE
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, trace clay, moist, brown.			13/10/10	5	117	
5		**ALLUVIUM** **SILTY SAND (SM):** fine to coarse-grained, few to little gravel up to 3.0 inches maximum dimension, medium dense, moist, yellowish brown.						
		End of boring at 5.0' feet bgs refusal due to potential conflict with utility. Groundwater not encountered. Borehole backfilled with soil cuttings mixed with cement and compacted by pushing down with an auger using drill rig weight,. Pavement patched with cut core and glued into place with Pro Select Anchoring Adhesive dyed black on 10/19/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-2

Log of Boring No. BH-02-Ruth Ellen Way

Date Drilled: 10/19/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1290 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		4" CEMENT CONCRETE/ 9" AGGREGATE BASE						
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 0.8 inches maximum dimension. trace clay, dense, moist, brown.	■	▨	14/20/33	9	132	PA
5		**ALLUVIUM** **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2.0 inches maximum dimension. trace clay, dense, moist, gray.	■		14/18/25	10	127	
		-@7.5': few to little gravel up to 2 inches maximum dimension, very dense.	■		50-5"	11	103	
10		Scattered to few gravel up to 1 inch maximum dimension -@10.0': scattered to few gravel up to 1 inch maximum dimension, brown.	■		18/20/43	9	113	
		End of boring at 11.5' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings mixed with cement and compacted by pushing down with an auger using drill rig weight. Pavement patched with cut core and glued into place with Pro Select Anchoring Adhesive dyed black on 10/19/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-3

Log of Boring No. BH-03-Celia Road

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1287 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 3 inches maximum dimension, scattered cobbles up to 8 inches maximum dimension, brown.	■		3/12/17	6	118	
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, trace clay, medium dense, moist, dark brown.	■	▨	6/15/20	23	107	DS
5		-@7.5': few clay, pinhole porosity.	■	▨	6/14/19	8	126	CR, CP
10		-@10.0': very dense.	■		17/46/50-4"	2	102	*disturbed
		End of boring at 11.4' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings and compacted with weight of drill rig on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-4

Log of Boring No. BH-04-Celia Road

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1311 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ARTIFICIAL FILL **GRAVELY SAND WITH SILT (SP):** fine to coarse-grained, scattered gravel up to 3 inches maximum dimension, scattered cobbles up to 8 inches maximum dimension, brown.	■		4/7/6	8	118	PA
5		**ALLUVIUM** **GRAVELY SAND WITH SILT (SP):** fine to coarse-grained, scattered to few gravel up to 3 inches maximum dimension, trace clay, very desiccated, medium dense, moist, brown.	■		18/22/43	22	90	
		CLAY WITH GRAVEL (CL): hard, moist, dark brown. -@6.0': yellowish brown.						
10		End of boring at 6.0' feet bgs due to refusal due to large concentration of aggregate. Groundwater not encountered. Borehole backfilled with soil cuttings and compacted with weight of drill rig on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-5

Log of Boring No. BH-05-Celia Road

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1332 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ARTIFICIAL FILL						
		SILTY SAND (SM): fine to coarse-grained, scattered gravel up to 3 inches maximum dimension, scattered cobbles up to 8 inches maximum dimension, brown.	■	▨	8/14/34	7	127	CR
		ALLUVIUM						
5		**SILTY SAND (SM):** fine to medium-grained, trace clay, pinhole porosity, dense, moist, dark brown.		▨				
		-@5.0': very dense.	■		13/17/50-3"	9	126	DS
		End of boring at 6.5' feet bgs due to refusal due to large concentration of aggregate. Groundwater not encountered. Borehole backfilled with soil cuttings and compacted with weight of drill rig on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-6

Log of Boring No. BH-06-Mary Place

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1356 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 3 inches maximum dimension, scattered cobbles up to 8 inches maximum dimension, brown.	■		13/14/26	5	123	
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 1 inch in maximum dimension, trace clay, dense, dry, brownish red.	■		23/50-3"	4	110	PA
5		-@5.0': very dense, roots, yellowish brown.			50-3"	2	99	*disturbed
10		-@10.0': grayish brown.	■		50-3"	2	112	*disturbed
		End of boring at 10.3' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings and compacted with weight of drill rig on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-7

Log of Boring No. BH-07-Mary Place

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1341 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 3 inches maximum dimension, scattered cobbles up to 8 inches maximum dimension, brown.						SE, CP
			■		12/10/12	6	114	
		ALLUVIUM **SILTY SAND (SM):** fine to medium-grained, trace clay, medium dense, dry, reddish-brown.						
5		-@5.0': very dense.	■		11/33/50	1	130	DS
		-@7.5': yellowish brown.			50-3"	3	108	*disturbed
10					50-4"	3	68	*disturbed
		End of boring at 10.3' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings and compacted with weight of drill rig on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-8

Log of Boring No. BH-08-Mary Place

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1353 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 3 inches in maximum dimension, scattered cobbles up to 8 inches in maximum dimension, brown.	■		8/44/50-3"	3	138	
5		**ALLUVIUM** **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 0.5 inches in maximum dimension, very dense, dry, yellowish brown.	■	▨	40/50-4"	5	115	CR, PA
		-@7.5": grayish brown.	■	▨	50-4"	2	120	*disturbed
10			■	▨	48/50-1"	3	69	*disturbed
		End of boring at 10.6' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings and compacted with weight of drill rig on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-9

Log of Boring No. BH-09-Mary Place

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1375 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 3 inches maximum dimension, scattered cobbles up to 8 inches maximum dimension, brown.	■	▨	6/27/29	6	125	
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, trace clay, dense, moist, dark brown.						
5		-@5.0': very desiccated, dry.	■		14/18/22	6	119	DS
		-@7.5': pinhole porosity, moist.	■		14/22/30	7	127	
10			■		16/20/22	12	114	
		End of boring at 11.5' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings and compacted with weight of drill rig on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-10

Log of Boring No. BH-10-Mason Avenue

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1381 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		4" CEMENT CONCRETE/ 3" AGGREGATE BASE						
		ALLUVIUM						
		SILTY SAND (SM): fine to coarse-grained, trace clay, medium dense, moist, yellowish brown.	■		11/13/19	7	128	
5		-@5.0': very dense.	■	▨	50-6"	11	113	SE
				▨	50-4"	6	107	
10				▨				
		SAND (SP): fine to coarse-grained, trace clay, very dense, moist, yellowish brown.	■		50-6"	5	114	
		End of boring at 10.5' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings, compacted using the weight of the drill rig and patched with cold patch on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-11

Log of Boring No. BH-11-Mason Avenue

Date Drilled: 10/18/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1375 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2" CEMENT CONCRETE/ 4" AGGREGATE BASE						CR
		ALLUVIUM						
		SILTY SAND (SM): fine to coarse-grained, trace clay, medium dense, moist, dark brown.	■		8/9/12	5	123	
5		-@5.0': pinhole porosity.	■		10/11/4	5	115	
		-@7.5': dense.	■		10/17/28	8	117	DS
10		-@10.0': brownish gray, very dense.	■		26/50-5"	5	127	
		End of boring at 10.9' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings, compacted using the weight of the drill rig and patched with cold patch on 10/18/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-12

Log of Boring No. BH-12-Los Alamos Road

Date Drilled: 10/19/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1374 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		5" CEMENT CONCRETE/ 2" AGGREGATE BASE						SE, PA
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 0.5 inches in maximum dimension, trace clay, pinhole porosity, very dense, moist, brown.	■		7/32/35	4	127	
5		**ALLUVIUM** **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 0.5 inches in maximum dimension, trace clay, pinhole porosity, medium dense, moist, brown.	■		5/6/7	4	110	
		-@7.5': caliche.	■		8/10/13	3	115	
10		-@10.0': fragments of rock.	■		50-4"	3	117	*disturbed
		End of boring at 10.3' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings mixed with cement and compacted by pushing down with an auger using drill rig weight. Pavement patched with cut core and glued into place with Pro Select Anchoring Adhesive dyed black on 10/19/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-13

Log of Boring No. BH-13-Los Alamos Road

Date Drilled: 10/19/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1351 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		5" CEMENT CONCRETE/ 4" AGGREGATE BASE						
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 1 inch maximum dimension, trace clay, medium dense, moist, light brown.	■		13/24/18	5	127	
5		**ALLUVIUM** **SILTY SAND (SM):** fine to coarse-grained, trace clay, dense, moist, brown. -@5.0': very dense.	■	▨	12/24/38	7	128	DS CP
		-@7.5': very dense.	■	▨	15/24/50-6"	9	117	
10		-@10.0': fragments of rockk.	■		13/42/50-3"	6	135	
		End of boring at 10.3' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings mixed with cement and compacted by pushing down with an auger using drill rig weight. Pavement patched with cut core and glued into place with Pro Select Anchoring Adhesive dyed black on 10/19/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-14

Log of Boring No. BH-14-Los Alamos Road

Date Drilled: 10/19/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1344 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		5" CEMENT CONCRETE/ 4" AGGREGATE BASE						PA
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, trace clay, very dense, moist, reddish-brown.	■	▨	14/43/50-5"	4	134	
5		**ALLUVIUM** **SILTY SAND (SM):** fine to coarse-grained, trace clay, very dense, moist, yellowish brown.	■		24/34/50-4"	10	114	
					50-4"	9	94	
10			■		50-5"	3	101	*disturbed
		End of boring at 10.4' feet bgs. Groundwater not encountered. Borehole backfilled with soil cuttings mixed with cement and compacted by pushing down with an auger using drill rig weight, pavement patched with cut core and glued into place with Pro Select Anchoring Adhesive dyed black on 10/19/2022.						

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-15

Log of Boring No. BH-15-Los Alamos Road

Date Drilled: 10/19/2022 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1321 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		5" CEMENT CONCRETE/ 2" AGGREGATE BASE						
		ARTIFICIAL FILL **SILTY SAND (SM):** fine to coarse-grained, trace clay, very desiccated, very dense, moist, brown.	■		21/50-4"	5	123	
5		**ALLUVIUM** **SILTY SAND (SM):** fine to coarse-grained, trace clay, moderately to very desiccated, very dense, moist, gray.	■		24/50-3"	7	113	
		BEDROCK **Undifferentiated Gabbro with Hornblende** **EXCAVATES AS SILTY SAND (SM):** fine to coarse-grained, very desiccated, very dense, moist, gray.	■		50-4"	10	94	
10					50-2"			

End of boring at 10.2' feet bgs.
Groundwater not encountered.
Borehole backfilled with soil cuttings mixed with cement and compacted by pushing down with an auger using drill rig weight. Pavement patched with cut core and glued into place with Pro Select Anchoring Adhesive dyed black on 10/19/2022.

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. A-16

Appendix B

Laboratory Testing Program

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their physical properties and engineering characteristics. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings, in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

***In-Situ* Moisture Content and Dry Density**

In-situ dry density and moisture content tests were performed on relatively undisturbed ring samples, in accordance with ASTM Standard D2216 and D2937 to aid soils classification and to provide qualitative information on strength and compressibility characteristics of the alignment's soils. For test results, see the Logs of Boring in Appendix A*, Field Exploration*.

Sand Equivalent

Four representative soil samples were tested in accordance with the ASTM Standard D2419 test method to determine the sand equivalent. The test results are presented in the following table.

Table No. B-1, Sand Equivalent Test Results

Boring No.	Street	Depth (feet)	Soil Description	Sand Equivalent
BH-01	Los Alamos Road	0.8 – 5.0	Silty Sand (SM)	34
BH-07	Mary Place	0.8 – 5.0	Silty Sand (SM)	23
BH-10	Mason Avenue	5.0 – 10.0	Silty Sand (SM)	29
BH-12	Los Alamos Road	0.6 – 5.0	Silty Sand (SM)	21

Soil Corrosivity

Four representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of soils when placed in contact with common construction materials. These tests were performed by AP Engineering and Testing, Inc. (Pomona, CA) in accordance with Caltrans Test Methods 643, 422 and 417. Test results are presented in the following table.

Table No. B-2, Summary of Soil Corrosivity Test Results

Boring No.	Street	Depth (feet)	pH	Soluble Sulfates (CA 417) (ppm)	Soluble Chlorides (CA 422) (ppm)	Min. Resistivity (CA 643) (Ohm-cm)
BH-03	Celia Way at Celia Way	5.0-10.0	7.6	35	26	2,107
BH-05	Celia Way at Mary Place	1.0 – 5.0	7.4	38	27	2,208
BH-08	Mary Place.	5.0 – 10.0	7.4	16	19	10,248
BH-11	Mason Avenue	0.5 – 5.0	7.3	35	24	2,045

Grain-Size Analyses

To assist in classification of soils, mechanical grain-size analyses were performed on six select samples in accordance with the ASTM Standard D6913 test method. Grain-size curves are shown in Drawing Nos. B-1a and B-1b, *Grain Size Distribution Results* and results are presented in the below table.

Table No. B-3, Grain Size Distribution Test Results

Boring No.	Street	Depth (ft)	Soil Classification	% Gravel	% Sand	%Silt	%Clay
BH-02	Ruth Ellen Way	1.1-5.0	Silty Sand (SM)	10.0	67.7	22.3	
BH-04	Celia Road	1.0–6.0	Gravely Sand with Silt (SP)	33.0	38.5	28.5	
BH-06	Mary Place	5.0–10.0	Silty Sand (SM)	0.0	83.6	16.4	
BH-08	Mary Place	5.0–10.0	Silty Sand (SM)	2.0	79.2	18.8	
BH-12	Los Alamos Road	0.6-5.0	Silty Sand (SM)	7.0	60.6	32.4	
BH-14	Los Alamos Road	0.8-5.0	Silty Sand (SM)	6.0	63.6	30.4	

Maximum Density and Optimum Moisture Content

Laboratory maximum dry density-optimum moisture content relationship tests were performed on three representative bulk samples. The tests were conducted in accordance with the ASTM Standard D1557 test method. The test results are presented in Drawing Nos. B-2a and B-2b, *Moisture-Density Relationship Results,* and are summarized in the following table.

Table No B-4, Summary of Moisture-Density Relationship Results

Boring No.	Boring No./ Street	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Density (lb/cft)
BH-03	Celia Road	5.0-10.0	Silty Sand (SM), Dark Brown	4.4	136.0
BH-07	Mary Place	0.8-5.0	Silty Sand (SM), Dark Brown	7.2	135.0
BH-13	Los Alamos Road	5.0-10.0	Silty Sand (SM), Brown	4.8	131.0

Direct Shear

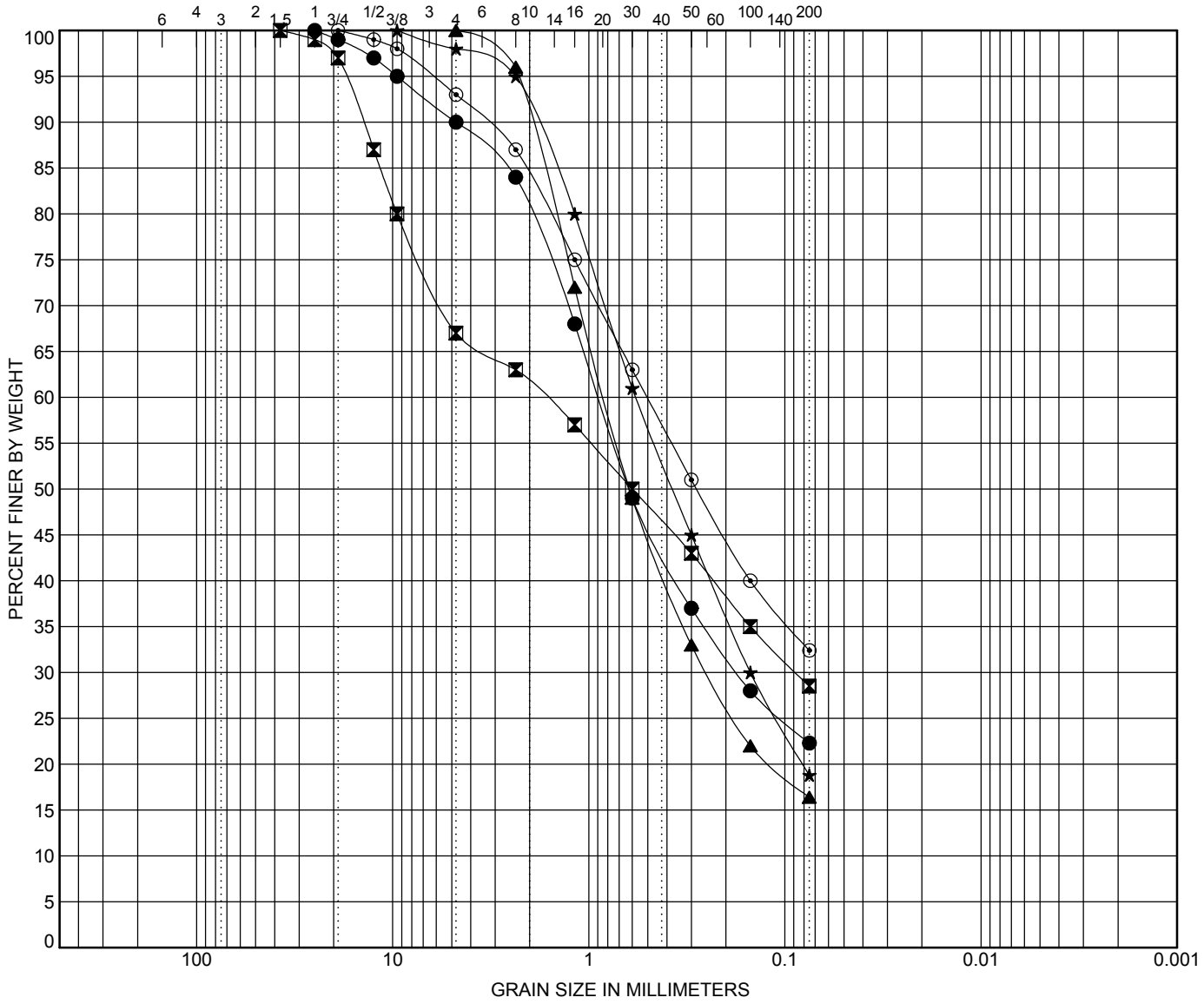
Six direct shear tests were performed on relatively undisturbed samples under soaked condition in accordance with ASTM Standard 3080. For each test, 3 samples contained in a brass sampler ring were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.02 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test results, including sample density and moisture content, see Drawing Nos. B-3 through B-08*, Direct Shear Test Results,* and in the following table.

Table No. B-5, Summary of Direct Shear Test Results

Boring No.	Boring No./ Street	Depth (feet)	Soil Description	Peak Strength Parameters	
				Friction Angle (degrees)	Cohesion (psf)
BH-03	Celia Road	5.0-6.5	Silty Sand (SM)	31	380
BH-05	Celia Road and Mary Place	5.0-6.3	Silty Sand (SM)	41	110
BH-07	Los Alamos Road	5.0-6.5	Silty Sand (SM)	25	540
BH-09	Mary Place	5.0-6.5	Silty Sand (SM)	31	290
BH-11	Mason Avenue	7.5-9.0	Silty Sand (SM)	30	250
BH-13	Los Alamos Road	5.0-6.5	Silty Sand (SM)	36	200

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	BH-02-Ruth Ellen Way	1.1-5.0	SILTY SAND (SM)					
⊠	BH-04-Celia Road	1.0-6.0	GRAVELY SAND WITH SILT (SP)					
▲	BH-06-Mary Place	5.0-10.0	SILTY SAND (SM)					
★	BH-08-Mary Place	5-10	SILTY SAND (SM)					
⊙	BH-12-Los Alamos Road	0.6-5.0	SILTY SAND (SM)					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH-02-Ruth Ellen Way	1.1-5.0	25	0.888	0.175		10.0	67.7	22.3	
⊠	BH-04-Celia Road	1.0-6.0	37.5	1.669	0.088		33.0	38.5	28.5	
▲	BH-06-Mary Place	5.0-10.0	4.75	0.829	0.248		0.0	83.6	16.4	
★	BH-08-Mary Place	5-10	9.5	0.575	0.15		2.0	79.2	18.8	
⊙	BH-12-Los Alamos Road	0.6-5.0	19	0.505			7.0	60.6	32.4	

GRAIN SIZE DISTRIBUTION RESULTS

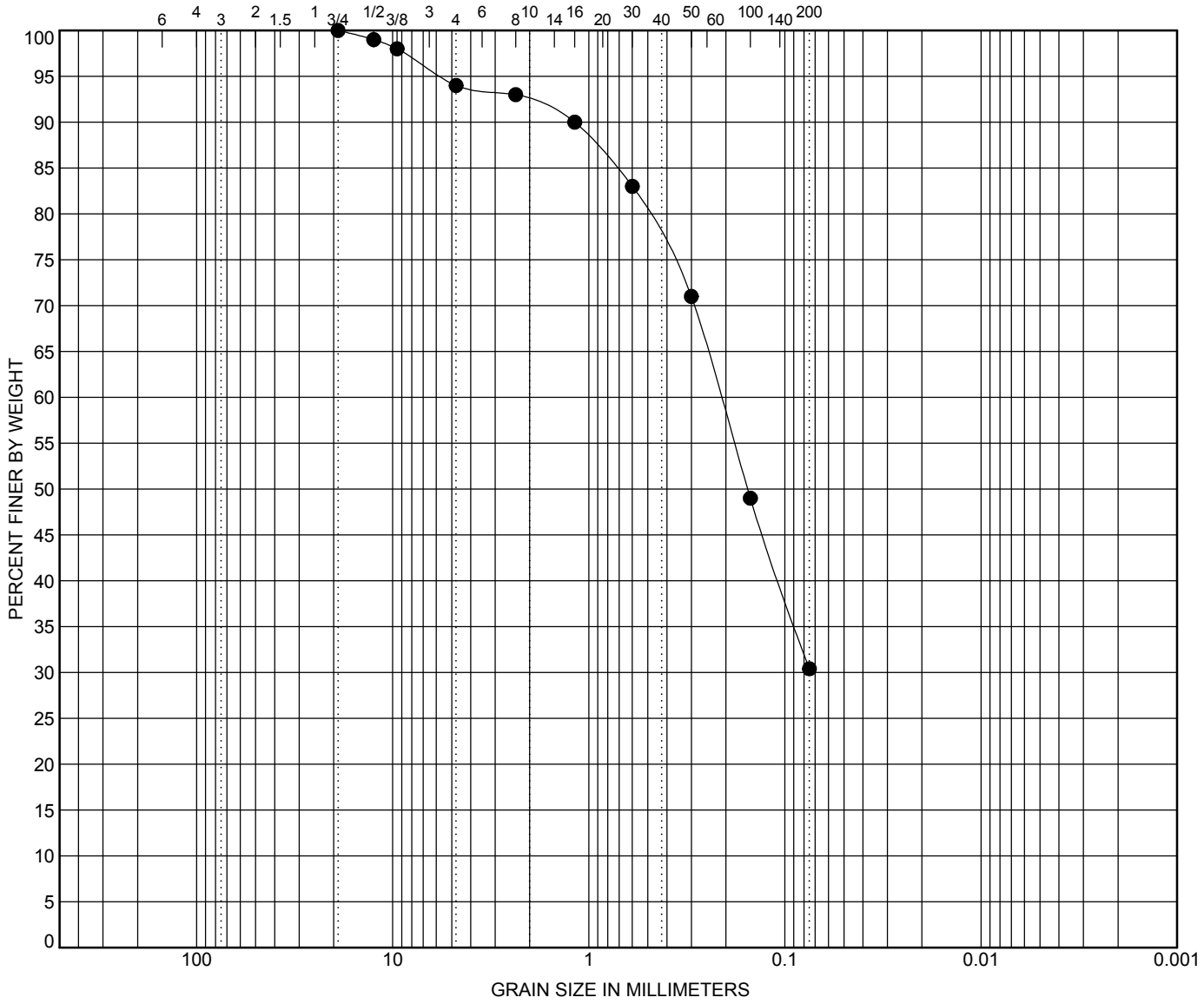
Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. **B-1a**

Project ID: 22-81-144-02.GPJ; Template: GRAIN SIZE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	BH-14-Los Alamos Road	0.8-5.0	SILTY SAND (SM)					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH-14-Los Alamos Road	0.8-5.0	19	0.212			6.0	63.6	30.4	

GRAIN SIZE DISTRIBUTION RESULTS

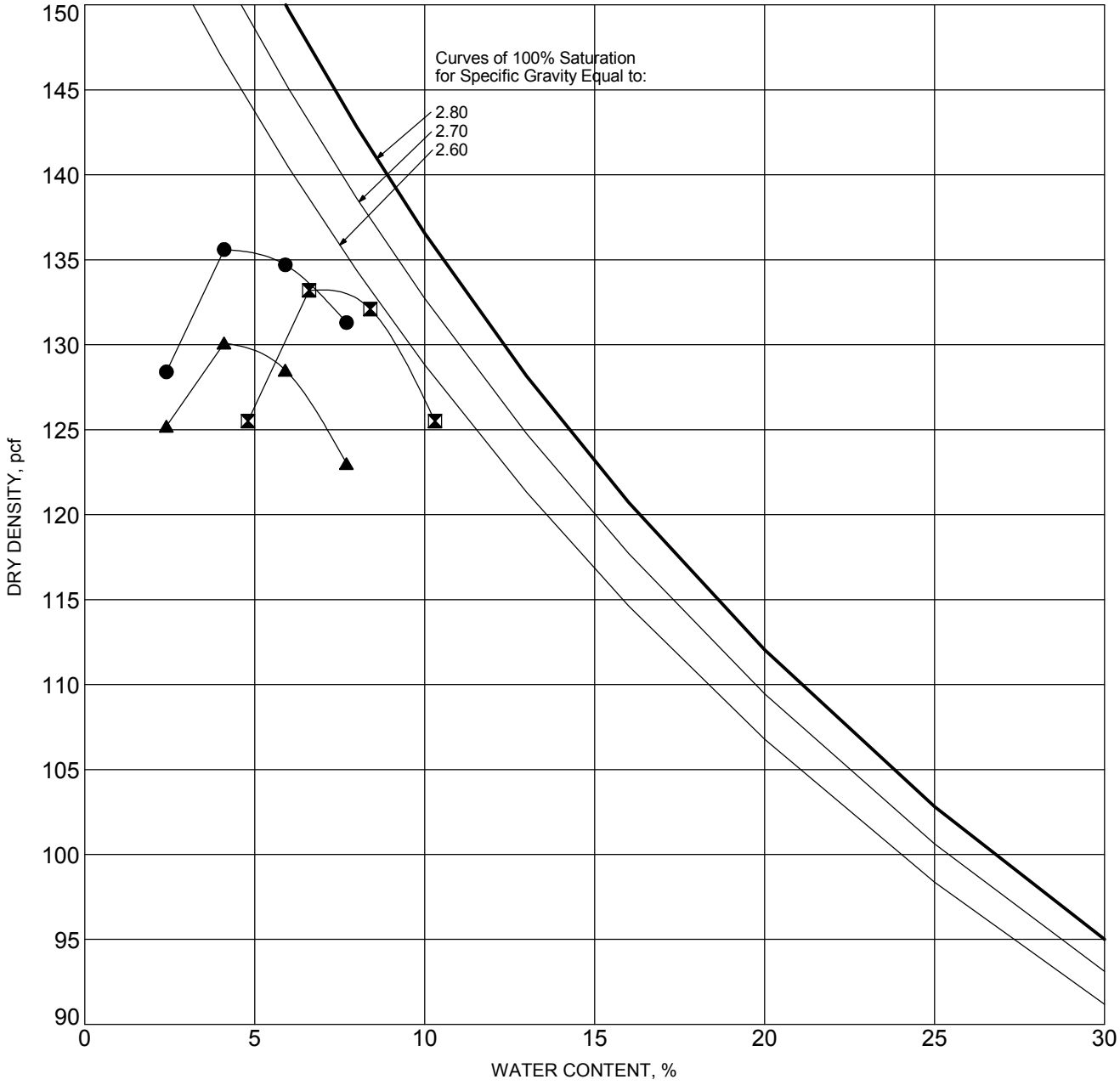
Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. 22-81-144-02

Drawing No. B-1b

Project ID: 22-81-144-02.GPJ; Template: GRAIN SIZE



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**BH-03-Celia Road**	**5.0-10.0**	**SILTY SAND (SM), DARK BROWN**	**D1557 A**	**4.4**	**136**
⊠	**BH-07-Mary Place**	**0-5.0**	**SILTY SAND (SM), REDDISH BROWN**	**D1557 A**	**7.2**	**135**
▲	**BH-13-Los Alamos Road**	**5.0-10.0**	**SILTY SAND (SM), BROWN**	**D1557 A**	**4.8**	**131**

MOISTURE-DENSITY RELATIONSHIP RESULTS

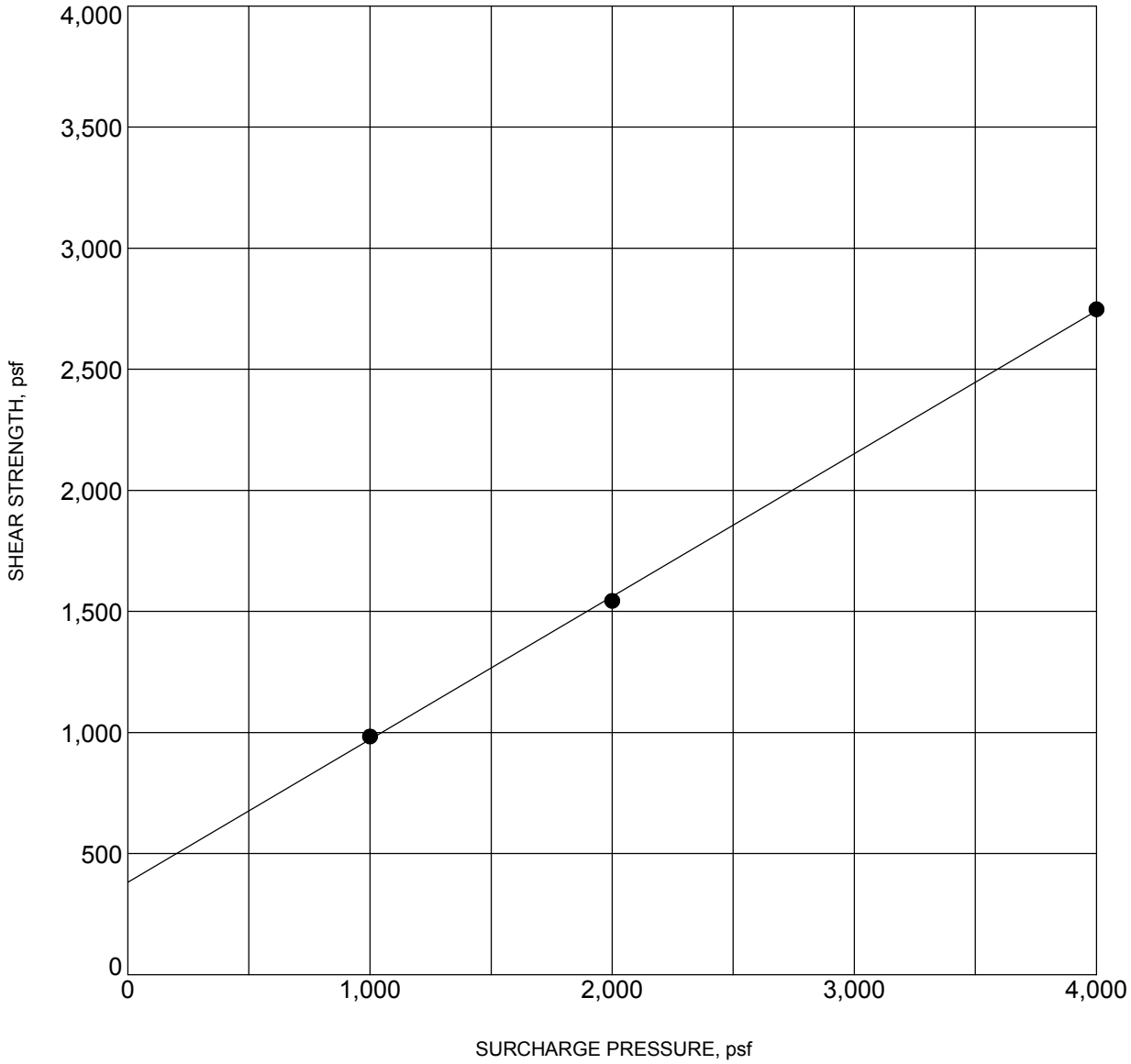
Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. **B-2**

Project ID: 22-81-144-02.GPJ; Template: COMPACTION



BORING NO.	:	**BH-03-Celia Road**	DEPTH (ft)	:	**5.0-10.0**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**380**	FRICTION ANGLE (degrees):		**31**
MOISTURE CONTENT (%)	:	**23.0**	DRY DENSITY (pcf)	:	**107.0**

NOTE: Ultimate Strength.

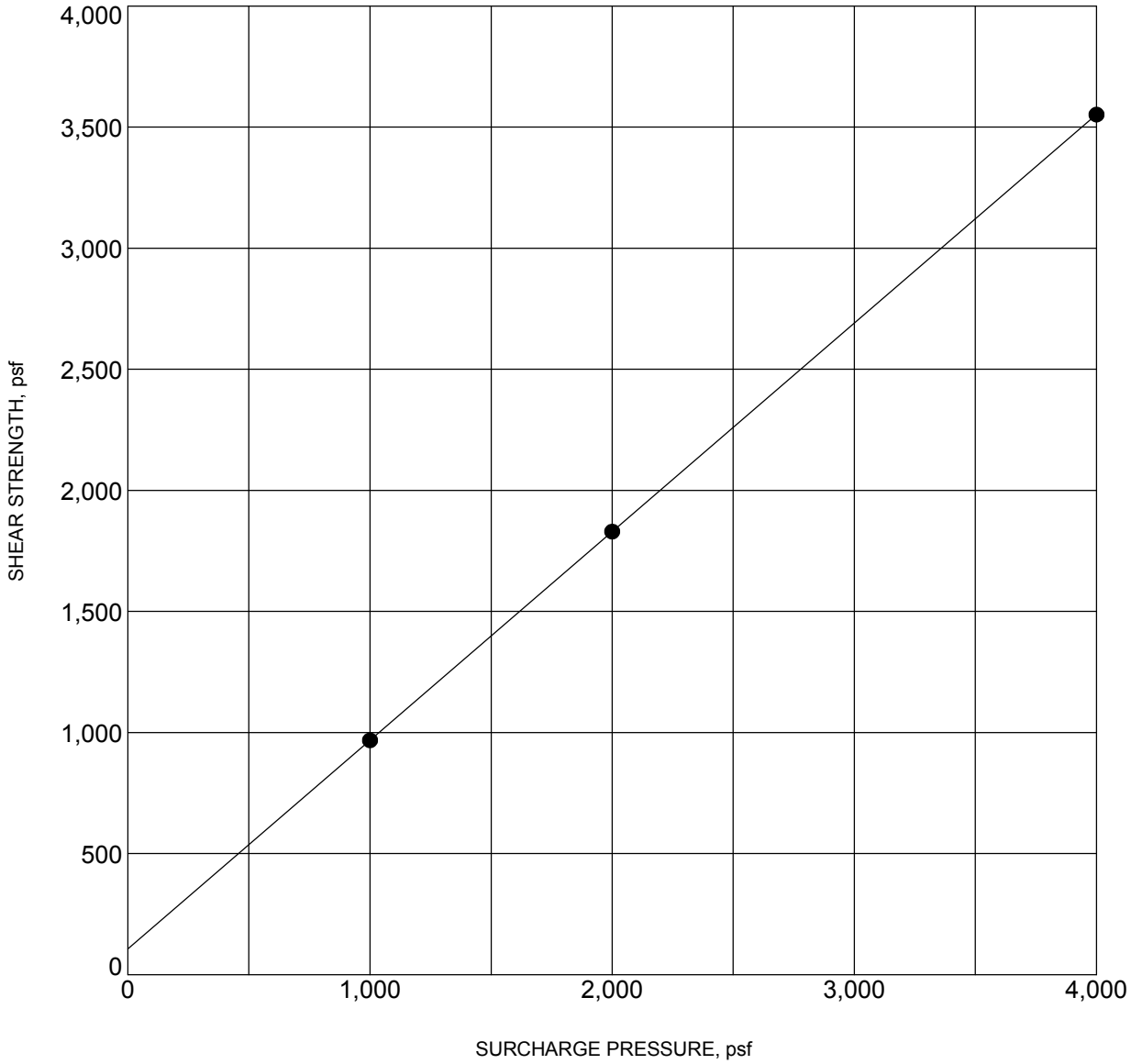
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. **B-3**



BORING NO.	:	**BH-05-Celia Road**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**SILTY SAND(SM)**			
COHESION (psf)	:	**110**	FRICTION ANGLE (degrees):		**41**
MOISTURE CONTENT (%)	:	**9.0**	DRY DENSITY (pcf)	:	**126.0**

NOTE: Ultimate Strength.

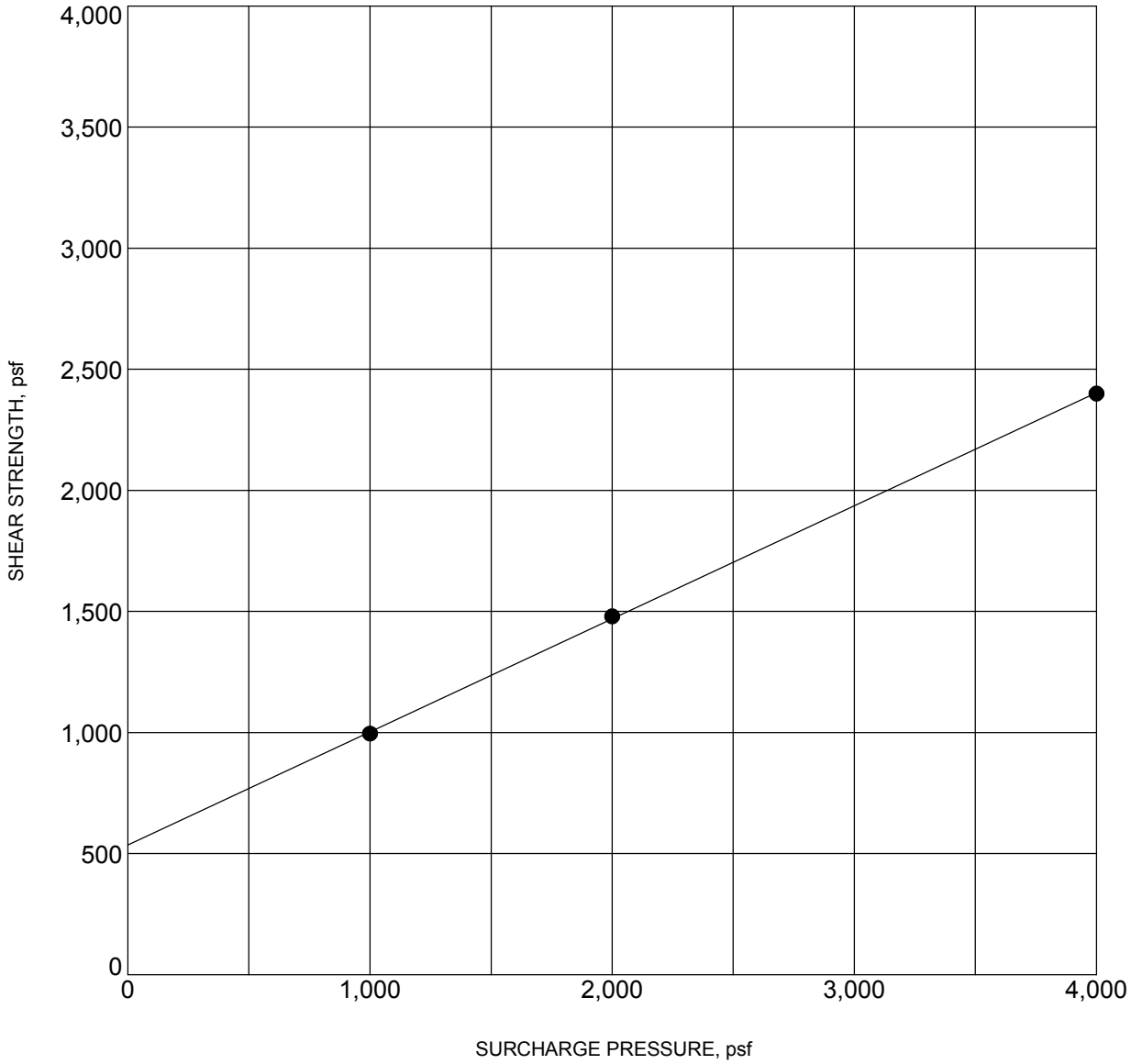
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. **B-4**



BORING NO.	:	**BH-07-Mary Place**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**SILTY SAND(SM)**			
COHESION (psf)	:	**540**	FRICTION ANGLE (degrees):		**25**
MOISTURE CONTENT (%)	:	**1.0**	DRY DENSITY (pcf)	:	**130.0**

NOTE: Ultimate Strength.

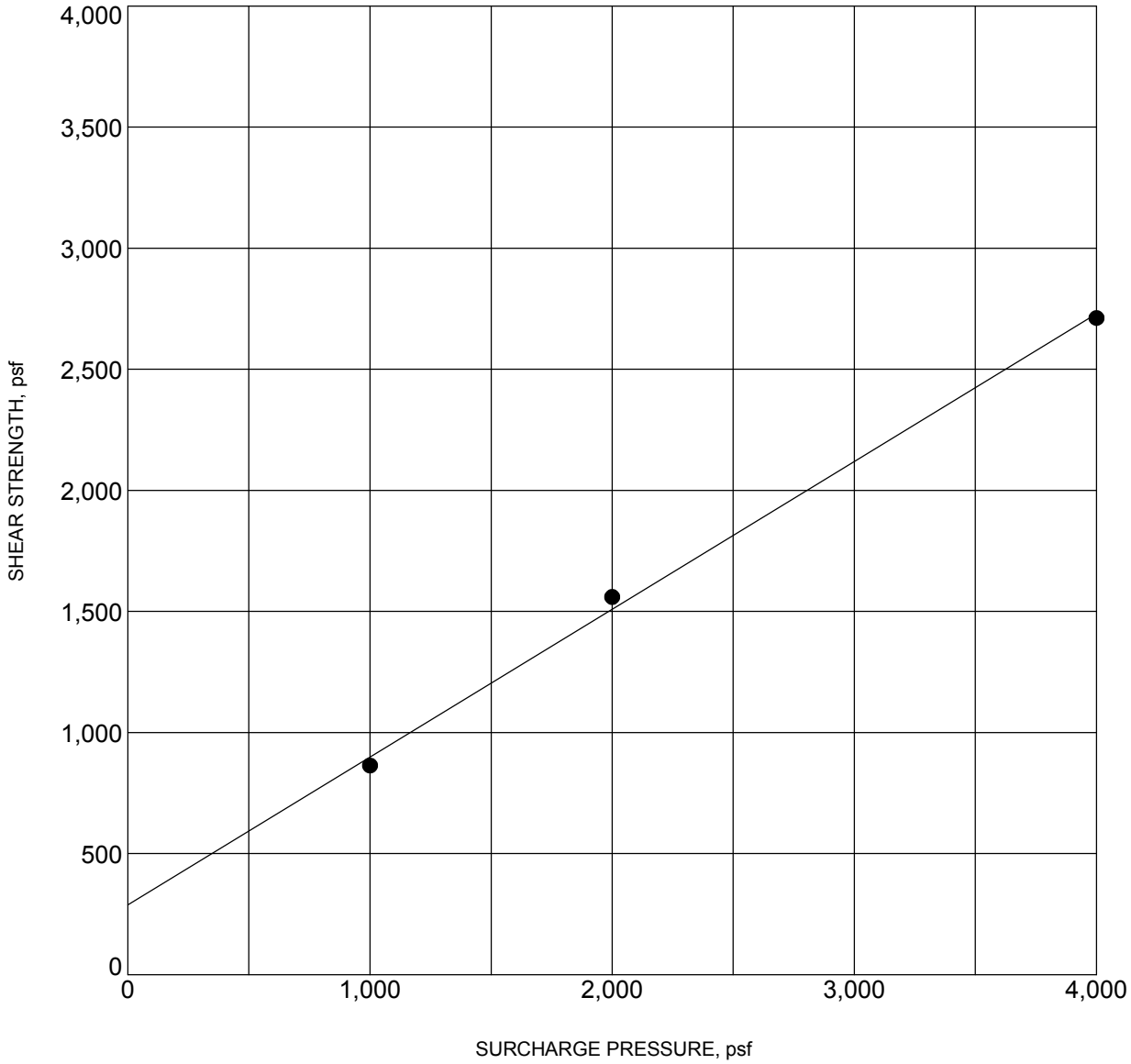
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. **B-5**



BORING NO.	:	**BH-09-Mary Place**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**SILTY SAND(SM)**			
COHESION (psf)	:	**290**	FRICTION ANGLE (degrees):		**31**
MOISTURE CONTENT (%)	:	**6.0**	DRY DENSITY (pcf)	:	**119.0**

NOTE: Ultimate Strength.

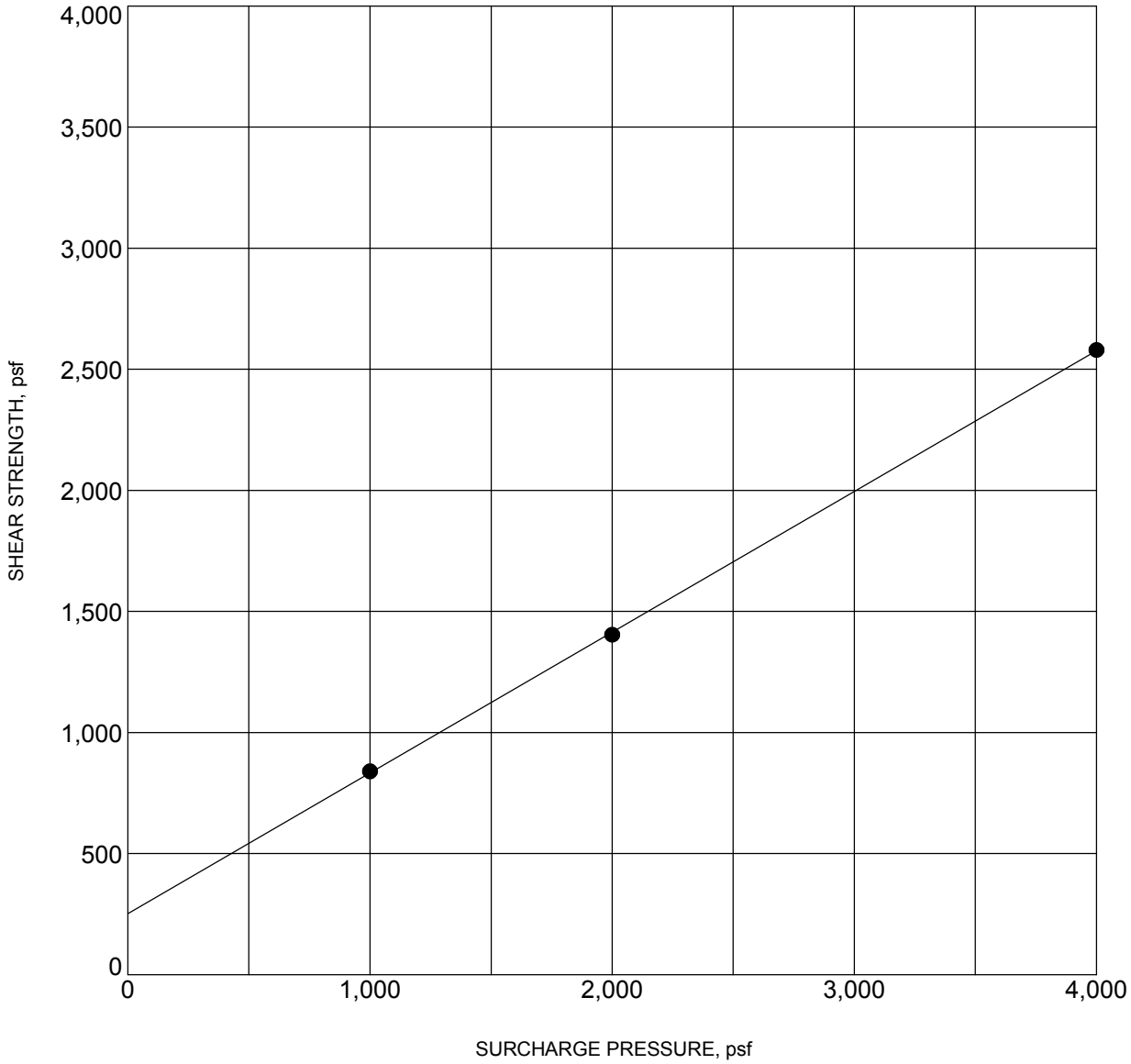
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. **B-6**



BORING NO.	:	**BH-11-Mason Avenue**	DEPTH (ft)	:	**7.5-9.0**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**250**	FRICTION ANGLE (degrees):		**30**
MOISTURE CONTENT (%)	:	**8.0**	DRY DENSITY (pcf)	:	**117.0**

NOTE: Ultimate Strength.

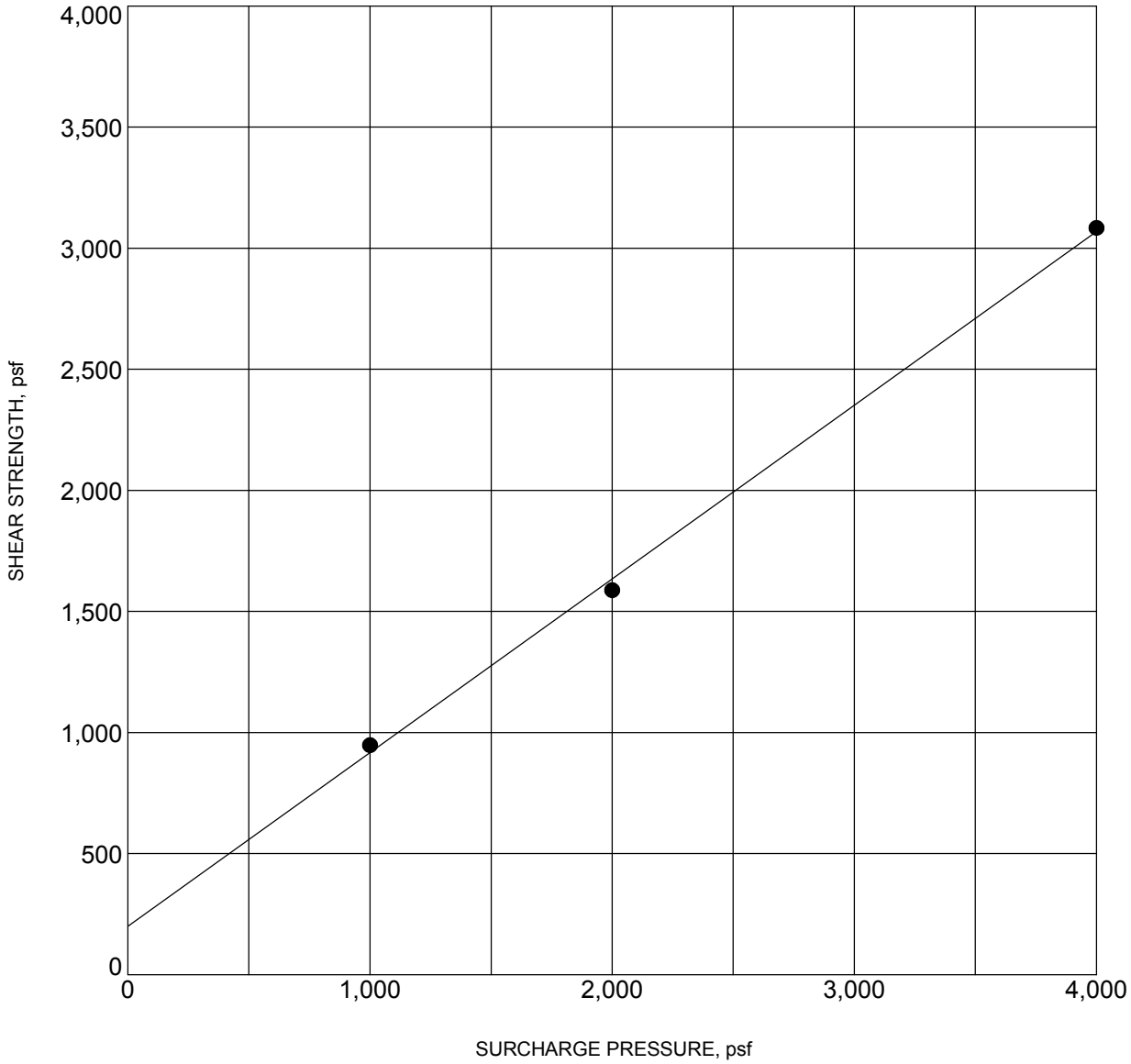
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. **B-7**



BORING NO.	:	**BH-13-Los Alamos Road**	EPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**200**	FRICTION ANGLE (degrees):		**36**
MOISTURE CONTENT (%)	:	**7.0**	DRY DENSITY (pcf)	:	**128.0**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name: EMWD Los Alamos Hills
Project Location: Los Alamos Road, Ruth Allen Way, Celia Road, Mary Place, and Mason Avenue
City of Murrieta, Riverside County, California
For: Webb Associates

Project No. **22-81-144-02**

Drawing No. **B-8**