PLEASANT VALLEY COUNTY WATER DISTRICT

RECYCLED WATER PIPELINE PRELIMINARY DESIGN REPORT

JANUARY 2023

PREPARED FOR:

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Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 INTRODUCTION

This section presents the background, objectives and report outline for the Laguna Road Pipeline Preliminary Design Report.

1.1 Background

Groundwater Sustainability Plan for the Pleasant Valley Basin

The Fox Canyon Groundwater Management Agency (FCGMA), acting as the Groundwater Sustainability Agency (GSA) for the Pleasant Valley Basin (PVB), developed a Groundwater Sustainability Plan (GSP) in 2019 to ensure that the PVB is sustainably managed in accordance with the 2014 Sustainable Groundwater Management Act (SGMA). SGMA defines sustainable groundwater management as the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results, which may include:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degraded water quality
- Significant and unreasonable land subsidence
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

As a member of FCGMA, Pleasant Valley County Water District (PVCWD) pursued and acquired a SGMA Implementation Grant to assist the financing of the PVB Implementation Project as detailed in the GSP. Per the grant proposal, the project background and need are defined as follows:

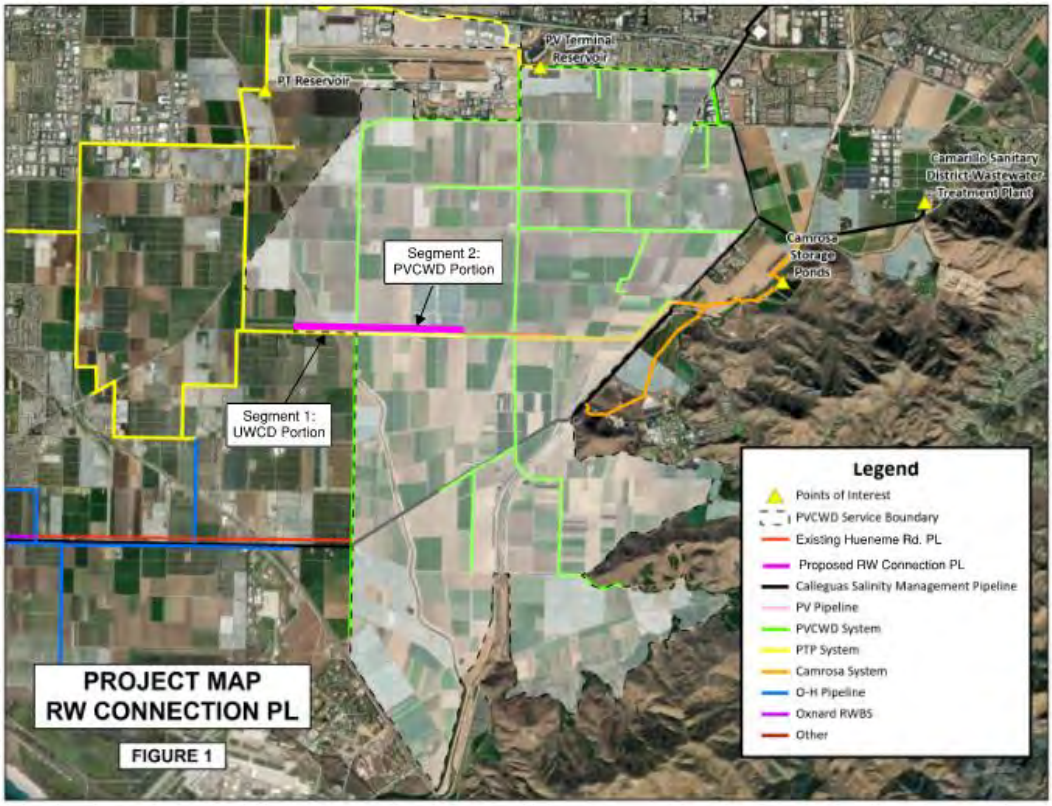
> ***Project Background***
>
> *A lack of storage and insufficient pipeline capacity within PVCWD system due to a bottle neck in current pipe configuration constrains the abilities to harvest additional Conejo Creek flows and receive City recycled water and adequately wheel excess flows to UWCD's PTP system.*
>
> ***Project Need***
>
> *To maximize the use of both the City's recycled water and the Conejo Creek water, both within the District's service area and adjacent United Water Conservation District's (UWCD) Pumping Trough Pipeline (PTP) system, a new pipeline is required to be constructed. The pipeline will require two components:*
>
> - ***Segment 1: PTP Connection.*** *An 18-inch from the District distribution system along Wood Road to a connection point on the PTP, approximately 3,400 feet to the west along Laguna Road. This portion would be the responsibility of UWCD and would be completed in coordination with*

the District. The connection would include a control facility that ensures proper flows and quality are delivered to meet both District and UWCD requirements.

- ***Segment 2: PVCWD Interconnection.*** *To provide hydraulic capacity for Oxnard recycled water to serve the entire District system and provide for potential Conejo Creek diversions to be delivered to the PTP, a new 18-inch is anticipated to interconnect the two main District transmission mains. This requires an estimated 18-inch pipeline from Wood Road to the east, approximately 8,000 feet along Laguna Road.*

Segment 2, as defined in the grant proposal, is the subject of this Preliminary Design Report (PDR) and is referred to as the Laguna Road Pipeline Project (Project). **Figure 1-1** provides an overview of the Project.

Figure 1-1 – Laguna Road Project Figure

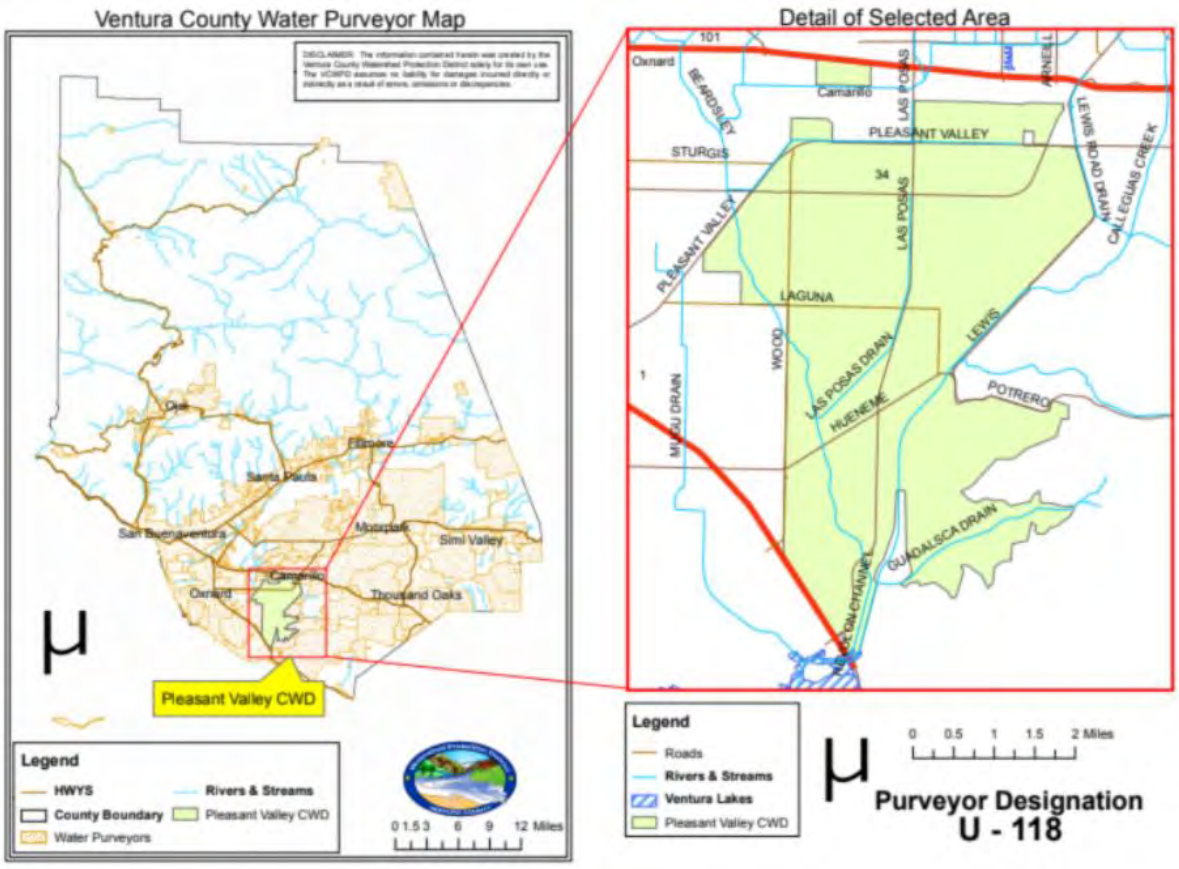


Source: Figure 1, SGMA Implementation Grant Proposal (January 2022)

Pleasant Valley County Water District

PVCWD was organized in 1956 with the purpose to construct a distribution system within the PVCWD service area boundary and connect to the Pleasant Valley Terminal Reservoir of the Pleasant Valley Pipeline constructed by United Water Conservation District (UWCD). The pipeline and reservoir supply supplemental irrigation water to farmlands within the PVCWD service area. The primary source of water distributed is from surface water received through the reservoir. An additional backup source of water is produced by the PVCWD's eleven deep wells which were placed into operation in 1981. The pipeline distribution system was designed to permit simultaneous water delivery of 75 cubic feet per second (CFS) over the total acreage served. PVCWD service area is shown in **Figure 1-2**.

Figure 1-2 – Pleasant Valley County Water District Service Area



Source: https://www.pleasantvalleycountywaterdistrict.com/service-area-map

PVCWD service area also includes two additional sources of supply, which are summarized as follows:

- ***Camrosa Water District (CWD)*** – CWD provides surface water diverted from Conejo Creek and recycled water received from the City of Camarillo and Camrosa Water Reclamation Facility. All three sources are supplied via a connection located near the intersection of Laguna Road and Las Posas Road.

- ***City of Oxnard (City)*** – The City constructed a connection near the intersection of Wood Road and Hueneme Road to supply recycled water from the City's Advanced Water Purification Facility (AWPF).

1.2 Objective

The objective of the Project is to connect the main east and west transmission mains to create a more effective and efficient PVCWD distribution system. In addition, the pipeline will provide a means of connecting the adjacent UWCD PTP system. The Project will provide two immediate benefits: 1) more effective usage and distribution of the City's recycled water and 2) the ability to harvest additional Conejo Creek water via CWD.

For agricultural water users, an increase in water quality is linked with a decrease in water usage. With the implementation of this component, more customers will benefit from high-quality water (City recycled water) thus increasing conservation impacts. In a similar fashion, this project will allow for an increase in the volume of water that can be harvested from the Conejo Creek when it is available.

PVCWD estimates that up to 4,000 acre-feet per year (AFY) of recycled water will be available from the City and another 1,000 to 2,000 of surface water is available for harvest from the Conejo Creek Diversion.

1.3 SGMA Implementation Grant Requirements

This project is defined in Grant Agreement No. 4600014641 as Component 2: PVCWD Recycled Water Connection Pipeline. The PDR efforts and deliverables are included in Component 2, Category (b): Environmental/ Engineering/ Design. A summary of the deliverables, as noted in the agreement, and their respective status are provided in **Table 1-1**.

Table 1-1 – Grant Requirements

Deliverables	Status
Initial Study (IS) and other California environmental Quality Act (CEQA) Documentation	Complete – **Appendix A**
All required permits	Required permits identified in Section 4; permits will be acquired during final design.
30% Draft Design Plans/ Specifications	30% Draft Design Plans Complete – **Appendix B** Technical Specifications Outline Complete – **Appendix C**
Final Design Plans/Specifications and Cost	To be completed following PDR
Copies of Right of Way (ROW), Encroachment Permits and/or Easements	ROW mapping included in 30% drawings; permits and/or easements will be acquired during final design.

1.4 Preliminary Design Report Organization

This PDR is organized as follows:

- ***Section 1 – Introduction***: Provides background information, introduces the report and explains report organization.
- ***Section 2 – Design Criteria***: Provides pipeline design criteria sufficient for final design, including summary of geotechnical investigation results and hydraulic modeling results.
- ***Section 3 – Alignment Evaluation***: Confirms pipeline location within Laguna Road based on evaluation of options for locating in public right-of-way or private easement.
- ***Section 4 – Permitting and Environmental***: Summary of the permit requirements and environmental study.
- ***Section 5 – Control Strategy***: Overview of anticipated UWCD turnout design and proposed control strategy.

2.0 DESIGN CRITERIA

General design criteria (i.e., hydraulic and geotechnical) which are applicable to the pipeline design are included in this section. The conceptual design defines relevant standards, conveyance capacity, alignment, materials, and appurtenances.

2.1 Geotechnical

A geotechnical investigation was conducted by Cotton, Shires and Associates (CSA) to confirm field conditions. Six (6) exploratory hollow-stem auger borings samples (depths ranging from 11.5 feet to 26.5 feet) were conducted on June 21, 2022. Laboratory tests were performed on select soil samples from borings. A project geotechnical report was completed and is included in **Appendix D**. This section provides a summary of key design criteria as provided in the geotechnical report. **Table 2-1** summarizes design criteria which will be utilized as part of the final design effort.

Table 2-1 – Geotechnical Design Criteria

Criteria	Value
General	
Site Classification	D
Non-paved Areas Compaction	
Min. Relative Compaction (Bedding and Pipe Zone)	90%
Min. Relative Compaction (Trench Zone)	90%
Paved Areas Compaction	
Min. Relative Compaction (Bedding and Pipe Zone)	90%
Min. Relative Compaction (Trench Zone)	90%
Min. Relative Compaction (Street Zone - 1-ft Subgrade below Pavement)	95%
Groundwater	
Groundwater Depth in B-1, B-2, B-3 & B-4	4 – 23 feet
Jack & Bore	
Jacking and Receiving Pits	2-3 feet below casing invert
Horizontal/Direct Drilling	
Drilling Angles	10-20 Degrees

Groundwater was encountered in four borings with the shallowest groundwater observed near Wood Road. Groundwater depth in the trenchless location at the Laguna Road drainage ditch crossing ranges from 18.5 to 23 feet. Groundwater was not encountered at the Laguna Road/Las Posas Road intersection. As indicated in the geotechnical report, a historical high groundwater level of about 5 to 7 feet below grade is noted in the Project vicinity. Very moist to wet conditions should be anticipated in excavations for both open trench and trenchless portions of the Project.

It is recommended to reduce heavy equipment loads during construction as much as practical in areas where the subgrade soils are well over optimum moisture content to reduce the potential need for subgrade stabilization of the excavated bottom. For areas encountering seepage or groundwater within the excavations, the excavation bottom should be stabilized prior to placement of bedding and fill material in accordance with the geotechnical report recommendations.

Pipe zone material shall consist of gravel or clean sand and shall be placed in loose lifts no greater than 6-inches thick and compacted to 90 percent relative compaction (ASTM D1557). Site soil is not suitable for backfill therefore pipe zone backfill material shall be imported to the project site. On site materials may be used as trench backfill if it is free of excessive moisture, deleterious material, organics, and oversized material (greater than 3 inches). On-site excavated clay soils shall be aerated prior to placing as trench backfill. Trench back fill shall be placed in loose lifts no greater than 8-inches thick and compacted to 90 percent relative compaction. The upper one foot of subgrade below paved areas shall be compacted to 95 percent relative compaction.

2.2 Asphalt Design

The Project is located within the jurisdiction of Ventura County, requiring that all road improvements and related traffic control shall adhere to the County of Ventura Public Works Agency Road Standards. Pavement repairs for road trenching are detailed in the following design standards:

- Plate E-4a Utility Cover
- Plate E-11 Pavement Repairs for Trenching
- Plate E-12 Pavement Repair for Trenching on Moratorium Roads

These plates are included on Sheet 15 of 30% Preliminary Design drawings included as **Appendix B**. The final design and specifications will be made to adhere to the Ventura County Public Works Agency Road Standards.

A summary of existing pavement sections at boring locations were recorded during the geotechnical investigation and included in **Table 2-2**.

Table 2-3 – Summary of Existing Pavement Sections

CSA Boring No. (1)	Asphalt Concrete Thickness (in.)	Aggregate Base Thickness (in.)	Total Pavement Section Thickness (in.)
B-4	6.0	4	10.5
B-6	4.5	4	8.5

(1) Boring locations are shown in **Appendix D**.

Per the geotechnical observation, it is recommended that the exposed surface be scarified 8 inches and moisture conditioned and compacted to 90 percent relative compaction. The upper 12 inches of pavement subgrade shall be compacted to a minimum of 95 percent of maximum dry unit weight (ASTM D1557). Aggregate base material shall be placed in lifts not exceeding 6-8 inches in thickness to at least 95 percent of the maximum dry unit weight (ASTM D1557). Proper drainage of paved and surrounding unpaved areas is essential and grade shall be established to expedite run off away from pavement.

2.3 Work Hours

The Ventura County Encroachment Permit Standard Conditions limits working hours to 7 AM to 5 PM, Monday through Friday. The standard conditions include peak-hour restrictions for County-maintained arterials and thoroughfares which

explicitly includes Las Posas Road and may include Wood Road and Laguna Road. For high-speed and high-volume roadways, the County requires that no work which interferes with traffic may occur between 7 AM to 9 AM and 4 PM to 5 PM.

2.4 Pipe Material

The pipeline in open trench areas will be constructed of polyvinyl chloride (PVC) C900 DR-21 pipe conforming to ANSI/AWWA C900 with ductile iron (DI) fittings conforming to ANSI/AWWA A21.10/C110. Fittings for the pipeline will include but are not limited to elbows, tees, and reducers. All DI pipe and fittings may be required to be wrapped in polyethylene sheet encasement for corrosion protection. Corrosivity test results presented in geotechnical report were preliminary and it is recommended a corrosion engineer evaluate the test results to assess how concrete structures and underground utilities should be protected from corrosion.

The pipeline in trenchless areas will be constructed of C900 RJ Certa-Lok DR-21 PVC restrained joint.

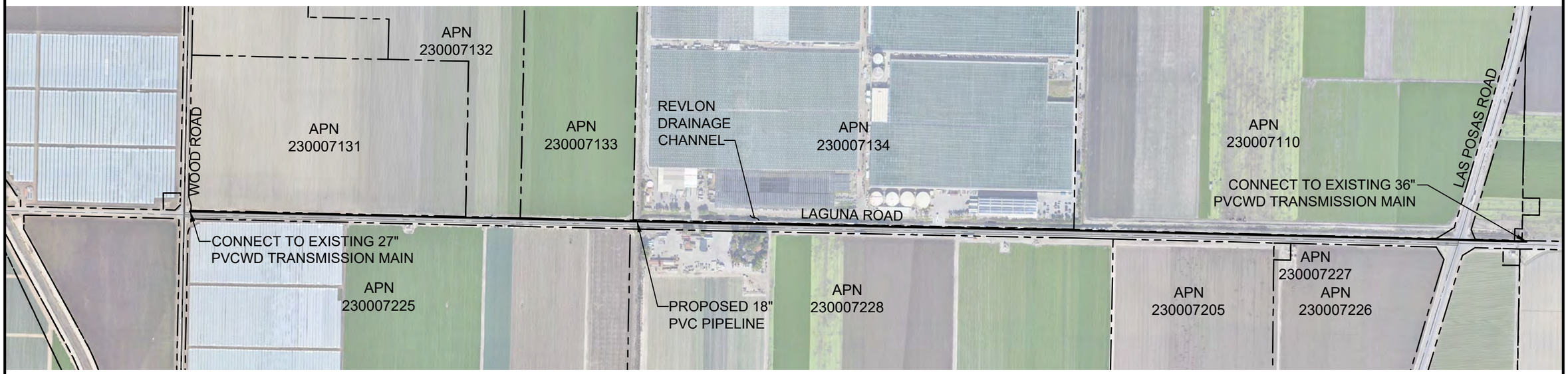
Unless required for flexibility or closure, it is anticipated that all buried joints will be restrained. Points of connection to existing piping and appurtenances shall be restrained. If restraint of a plain-end joint is required, it will be accompanied by a joint harness. Thrust restraint provided by thrust blocks and collars will also be considered as a reasonable alternative to restrained joints where they would be cost effective.

2.5 Length and Sizing

The pipeline will be approximately 6,536 feet in length and installed along the north side of Laguna Road between Wood Road and Las Posas Road (see **Figure 2-1**). The pipeline will tie into the existing 27-inch pipeline at Wood Road and the existing 36-inch pipeline approximately 400 feet east of Las Posas Road.

In support of further defining the Project, MKN completed development of a hydraulic model and subsequent model analysis. The hydraulic modeling effort is documented in the Water Model Technical Memorandum (MKN, December 2022) provided as **Appendix E**. The hydraulic model provided confirmation of the appropriate pipe sizing. Based on the analysis of various scenarios, an 18-inch diameter is recommended as it provides adequate capacity for the scenarios evaluated (maximum velocity of 2.6 ft/sec) and provides additional capacity for operational flexibility.

Based on the provided record drawings, the existing 27-inch main at Wood Road is approximately four feet below existing grade, and the existing 36-inch main at Las Posas Road is approximately eight feet below existing grade. The proposed 18-inch pipeline will be constructed in a 3.5 feet wide trench and approximately 4 feet below existing grade except for trenchless locations. Potholing of the existing pipelines should be performed prior to final design.



PLAN

SCALE: 1"=600'

N

PIPELINE NOTES:

PIPE LENGTH = 6,536.00 LF

Pleasant Valley County Water District

16310 Bake Parkway
Irvine, Ca. 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT

PROPOSED PIPELINE ALIGNMENT

FIGURE 2-1

PRELIMINARY DESIGN-NOT FOR CONSTRUCTION

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2.6 Construction Methods

This section describes the construction methods proposed for the Project. The recommended construction method will be open trench except for the Laguna Road drainage crossing and Las Posas Road crossing which will be trenchless. The latter trenchless crossing is intended to be further discussed with the County of Ventura as part of final design, as it may be possible to proceed in this area with open cut. Each construction method is further described in the following subsections and specific locations are detailed in the Preliminary Design, provided as **Appendix B**.

2.6.1. Open Cut Construction

For most of the Project, open cut installation is the preferred method of installation of the pipeline. Open cut provides for greater participation of local contractors, shallower burial depths, less complex equipment, and potentially lower overall costs for installation.

2.6.2. Trenchless Construction

Jack and Bore Construction

In areas where traffic interruption is required to be minimized, or open cut construction cannot be utilized without extensive permitting and restriction, Jack and Bore construction also known as horizontal auger boring can be utilized. Trenchless construction is commonly used at certain crossings, such as railroads, roadways, and flood control channels. Jack and Bore construction is currently recommended for the Las Posas Road crossing.

The typical Jack and Bore installation begins with the excavation of jacking and receiving pits at the beginning and end of the proposed trenchless section. Jacking pits are significantly larger to account for the Auger Boring Machine (ABM), which must brace itself against the back wall of the shaft. The bottom of the bore shaft is usually over-excavated and backfilled with crushed stone to provide adequate support for the equipment. Due to the presence of groundwater and seepage, and varying soil types at this site, the use of a face shield to facilitate the boring operations and maintaining correct alignment is recommended. It is recommended to hire an experienced drilling contractor familiar with sites with high groundwater and mixture of fine and coarse grained soils. If possible, the tunneling operation should be performed during the summer months when groundwater level is low. Where required, a dewatering system shall be designed, installed, and operated by an experienced contractor. Geotechnical conditions shall be reviewed when selecting boring, tunneling, and drilling equipment.

The jacking and receiving pit bottoms should be excavated to at least 2 to 3 feet below the casing invert. Typical jacking pit dimensions for pipelines such as this are roughly 12 feet in width by 36 feet in length. Receiving pit dimensions are smaller at roughly 12 feet in width by 12 feet in length.

It is recommended to use a welded steel pipe for the casing in order to prevent potential damage caused by the rotating augers and any corrosive soils. After successful installation of the casing pipe, the carrier pipe can be installed. The carrier pipe is installed by attaching casing spacers to the outer diameter of the pipe prior to insertion, which will keep the carrier pipe centered within the casing.

A casing size of 30 inches is anticipated to be sufficient to carry the 18 inch diameter pipe through the trenchless crossing.

Horizontal Directional Drilling (HDD) Construction

HDD construction is a potential alternative to Jack and Bore and it is suitable for soft to hard clays, wet soils, and environmentally sensitive areas. This method avoids the need for large pits to install jacking and boring machines. Typically, sending and receiving pits for HDD are smaller than jacking and receiving pits used in Jack and Bore construction.

Drilling angles between 10 to 20 degrees are typically utilized as the drill string penetrates the ground at the prescribed entry point. The type of drill pipe or pipe installed limits the radius, or curvature of the bore. In general, the minimum radius of the bore is estimated as being 100 times the diameter of the pipe being installed.

Directional drilling is best suited for firm ground. Drilling may be advanced through gravel, cobbles or rock (if encountered) which increase drilling time and tolerances may be more difficult to maintain. Pre-grouting or cementing the formation in advance of drilling can be used to assist with the drilling.

HDD construction is recommended for the Laguna Road drainage crossing (approximately 2,700 feet east of Wood Road crossing). It is assumed the minimum depth below the bottom of the channel is 10-15 feet. Utilizing a pipe depth of 20 feet, the overall trenchless installation utilizing HDD is estimated to be approximately 200 feet. Tolerances for directional drilling operations can typically be less than one percent of the length of the trenchless installation, meaning the tolerance would be at least 2 feet. Monitoring can be accomplished using walkover or wireline systems.

Typical sending and receiving pits dimensions for pipelines such as this are roughly 12 feet in width by 12 feet in length. It is recommended to use C900 RJ Certa-Lok DR-21 PVC restrained joint.

2.7 Construction Staging

The Contractor is anticipated to require laydown areas for equipment and material storage. As part of final design, these requirements will be estimated and discussed with PVCWD staff. The use of PVCWD owned land could be made available to the Contractor for use during construction, or agreements negotiated for temporary use with landowners directly adjacent to the Project.

2.8 Pressure Class

PVC C900 pipes are available in different pressure classes ranging from 80 to 305 pounds per square inch (psi). The proposed pipeline will be connected to 50 psi pressure zone pipeline. It should be noted that although the internal pressure is lower than 200 psi, PVC C900 DR 21 (200 psi) is proposed for this pipeline.

2.9 Appurtenances

This section summarizes the anticipated appurtenances for the Project and the respective design approach or standards. Current PVCWD specifications and standards for these appurtenances will be incorporated where applicable. For above grade pipeline features such as the new customer meter and air release valve, clearance from the roadway shall adhere to Plate E-13 of the Ventura County Road Standards, 10 feet from the edge of pavement is required when no curb, gutter and/or sidewalk exists.

- Isolation Valves – Per discussions with PVCWD staff, the Project will not include any in-line isolation valves. However, valves will be installed at each pipeline for interconnections to the transmission mains in Wood Road and Los Posas Road. Isolation valves will be ductile iron body resilient wedge gate valve to conform to AWWA C515-09.

- Air and Vacuum Release Valves – At each high point in the pipeline and in-line valve location, an air and release valve will be located. PVCWD does not have standard details for air and vacuum release valves, therefore the Ventura County Waterworks Standard Plate No. 3 is referenced. Sizing and design will be completed during final design.

- Customer Turnout – There is one existing meter turnout that will be required to be reconnected as part of the Project. The conversion from the existing pipeline to the new will need to be defined as part of the final design construction documents. The noted turnout is shown on Sheet 8 of the Preliminary Design, provided as **Appendix B**.

- Blow Off – Each low point and in-line valve location will be fitted with blow offs. PVCWD does not have standard details for a blow offs therefore the Ventura County Waterworks Standard Plate No. 10 is referenced. Sizing and design will be completed during final design.

- Future UWCD Turnout – The design will include a new cross at the transmission main connection within Wood Road. The cross will include three isolation valves: one on the new Laguna Road pipeline, and two on the Wood Road transmission main. The west facing cross turnout will be fitted with a blind flange for future connection by UWCD. Additional discussion regarding the future connection is provided in **Section 5.1**.

3.0 ALIGNMENT EVALUATION

This section provides an evaluation of two alternatives for locating the pipeline within the Laguna Road alignment.

3.1 Survey

Topographic base mapping was compiled at a scale of 1" = 40" with a one-foot contour interval using standard photogrammetric methods and procedures by Aerotech Mapping Inc. from aerial photography obtained on April 13, 2022. The topographic base mapping was supplemented by data collected from a field survey using real time Kinematic GPS Equipment and procedures in April 2022.

3.2 Utility Research

MKN conducted research of utilities, via DigAlert Contact Lookup, within the Project area and completed outreach to identified utilities. Impacted utilities were mapped on base maps developed following field survey as described in Section 3.1. **Table 3-1** summarizes the results of that outreach.

Table 3-1 – Utility Research Results

Utility Provider	Outcome
AT&T (Phone/Cable)	No impact
CWD (Water)	Provided Plans
Crown Castle Cable (Cable)	Provided Plans
Frontier (Cable)	Provided Plans
Southern Cal Gas (Gas)	Provided Plans
SCE (Electricity)	Provided Plans
Ventura County Transportation Department	No Response

3.3 Roadway Moratorium

Laguna Road is maintained by the County of Ventura which requires that all roadways overlaid within the previous five years of the permitted excavation be subject to special repair procedures, including but not limited to, complete overlay of the lane(s) in which the excavation is made. Based on review of the County's online GIS mapping tool, Laguna Road was last overlaid in 2019 which would result in a moratorium until 2024. The type of roadway improvement is not stated on the GIS tool, but if it is a rehabilitation instead of an overlay, the moratorium duration is reduced to two years instead of five.

3.4 Alignment Alternatives

Based on utility research, field survey and roadway moratorium constraints, two alignment alternatives were developed (see **Figure 3-1**). The two alternatives are described as follows:

Alternative 1 – Pipeline in Un-Paved Area

Alternative 1 consists of installation along the north shoulder of Laguna Road within Right-of-Way in unpaved area. Installation of this alternative will be via open trench except for the Laguna Road drainage crossing and Las Posas Road crossing which will be trenchless. This alignment minimizes traffic disruption and avoids repaving of the entire traffic lane along Laguna Road.

Horizontal clearance between the proposed pipeline trench and the Frontier overhead cable and poles is approximately 6-8 feet. There are no OSHA requirements for low voltage overhead line and pole clearance with regards to trenching applications. In lieu of a formal requirement, standard trenching procedures shall be used and a minimum clearance of 2 feet from the pole shall be ensured. Special care should be taken to avoid any conflict with the portion of the buried pole.

Alternative 2 – Pipeline in Paved Road

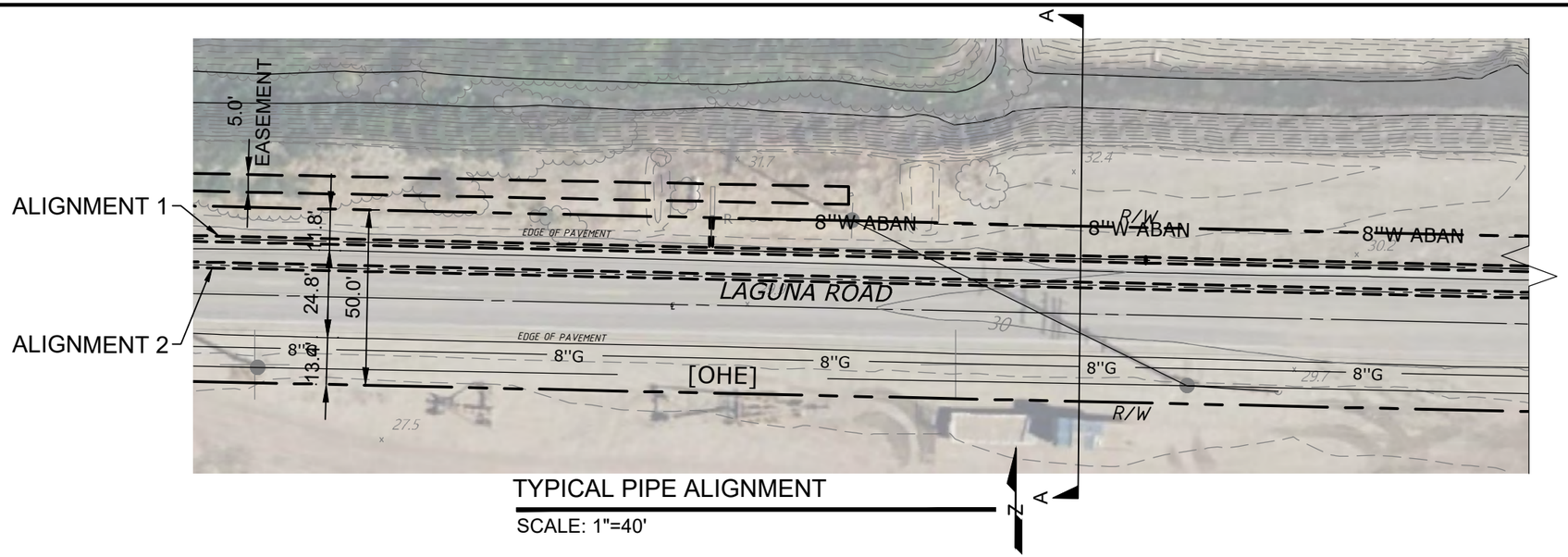
Alternative 2 consists of installation in the north bound traffic lane of Laguna Road. Open trench and trenchless sections options are similar to Alternative 1. This alternative requires closure of one traffic lane, development of traffic control and detour plans, demolishing and repaving full road width of the asphalt concrete pavement along north bound lane of Laguna Road, and slurry back fill of the trench per County of Ventura requirements.

3.5 Conceptual Alternatives Cost Comparison

A planning level Opinion of Probable cost was developed for the two alternatives; the level of accuracy is consistent with a Class 5 estimate as defined by the Association for the Advancement of Cost Engineering (AACE). Class 5 estimates are typically developed based on limited available information using unit cost or cost/capacity curve methodologies and have an accuracy range of -20 to -50 percent on the low side and +30 to +100 percent on the high side. The planning level cost estimate is summarized in **Table 3-2**.

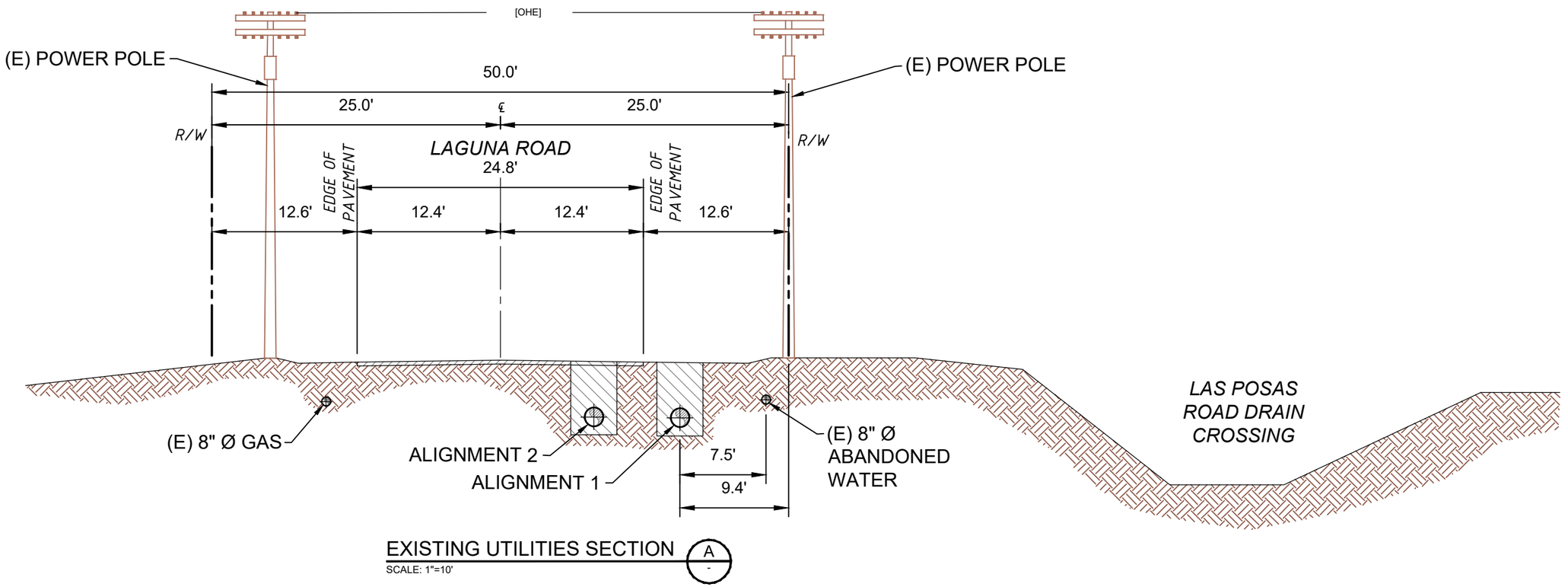
PIPELINE NOTES:

PIPE LENGTH = 6,536.00 LF



TYPICAL PIPE ALIGNMENT

SCALE: 1"=40'



EXISTING UTILITIES SECTION A

SCALE: 1"=10'

Pleasant Valley County Water District

mkn

16310 Bake Parkway
Irvine, Ca. 92618
(714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT

PROPOSED ALIGNMENTS AND EXISTING UTILITIES SECTION VIEW

FIGURE 3-1

PRELIMINARY DESIGN-NOT FOR CONSTRUCTION

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Table 3-2 – Engineer's Opinion of Probable Construction Cost for Pipeline Alternatives

Description	Estimated Cost	
	Alt. 1	Alt. 2
Mobilization, Cleanup and Demobilization (5%)	$128,000	$246,000
Stormwater Best Management Practices (BMPs)	$10,000	$10,000
Potholing	$7,000	$7,000
Traffic Control	$25,000	$40,000
Pipeline & Fittings (7,750 feet @ $144/ft) (1)	$1,764,000	$1,953,000(2)
Pavement Restoration ($25/SF)	$230,500	$2,386,000
HDD at Laguna Road Drainage Crossing (200 feet)	$194,000	$194,000
Jack and Bore at Las Posas Road Crossing (200 feet)	$314,000	$314,000
Construction Subtotal	**$2,673,000**	**$5,150,000**
Construction Contingency (25%)	$668,000	$1,288,000
Inflation to Construction Midpoint (6%, Dec 2023)	$200,000	$386,000
Construction Total	**$3,541,000**	**$6,824,000**
Final Design & Permitting (8%)	$283,000	$546,000
Eng. During Construction/Const. Mgmt. (10%)	$354,000	$682,000
Project Total	**$4,178,000**	**$8,052,000**

NOTES:
(1) Includes trenching, backfill, pressure test, connection to existing pipe, and abandonment of existing 8" pipe.
(2) Includes slurry backfill for paved area.

4.0 PERMITTING AND ENVIRONMENTAL

This section summarizes the permits identified for the completion of the project and summarizes the environmental review efforts.

4.1 Permits

The following permits will be required for construction:

- Encroachment Permit: The Contractor will be required to acquire an Encroachment Permit from Ventura County Public Works Agency. The permit requires completion of an application and inclusion of the project plans, traffic control plan, and insurance certificate. The traffic control plan shall be consistent with the traffic-control and safety standards described in either the California Manual of Uniform Traffic Control Device (CAMUTCD) or the Work Area Traffic Control Handbook (WATCH) by Building News, Inc. All safety devices must conform to the requirements of the most current sign manual published by the California Department of Transportation and the applicable sections of the California Vehicle Code.

- Watercourse Protection Permit: The Contractor will be required to acquire a Watershed Protection Permit from Ventura County Watershed Protection District. The permit is required for any work or activity conducted under a channel. The permit requires completion of an application, inclusion of the project plans and location map showing the activity and proposed construction.

4.2 Environmental

An environmental investigation was conducted by Rincon Consultants, Inc. The environmental efforts included the Initial Study, a Cultural Resources Records Search, Native American Heritage Commission Sacred Lands File Search, Field Survey, and Negative Findings Report, which are included in **Appendix A**. The Field Survey was conducted by a Rincon biologist on July 8, 2022 and included the project site and a 50-foot buffer (biological study area). The Mitigated Negative Declaration summarizes the findings of all environmental efforts. The mitigation measures are as follows:

- Nesting Bird Pre-Construction Survey and Avoidance Buffers (BIO-1)
- Avoidance Buffers and Best Management Practices for Aquatic Resources (BIO-2)
- Unanticipated Discovery of Paleontological Resources (GEO-1)
- Hazardous Materials Management and Spill Control Plan (HAZ-1)
- Traffic Control Plan (HAZ-2)

With regards to BIO-1, the Nesting Bird Pre-Construction Survey is only a requirement should construction be required within the bird breeding season (February 1 to August 31). While construction activities are recommended to be outside this period, where practical, BIO-1 is required no more than 14 days prior to construction activities within the nesting period.

5.0 CONTROL STRATEGY

The Project provides for hydraulic capacity to deliver CWD flows more efficiently to UWCD. In support of this and to provide the ability to convey the City's recycled water from the PVCWD distribution system, infrastructure will be installed as part of this project to facilitate this future connection. This section provides the baseline operational understanding and infrastructure required.

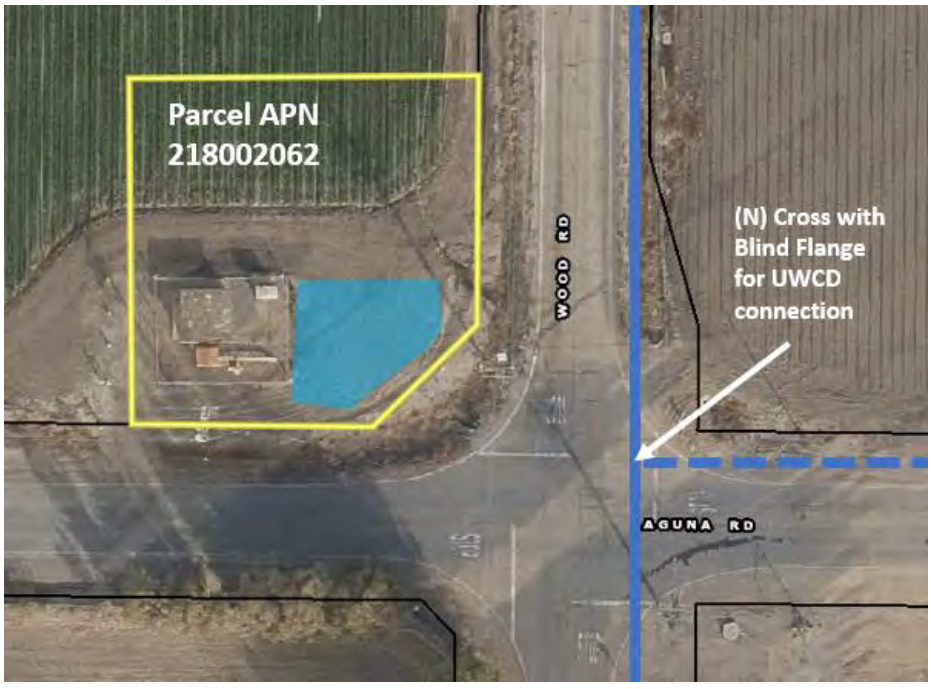
5.1 UWCD Connection Overview

The Project will terminate at the existing 27-inch PVCWD owned transmission main located on the east side of Wood Road. To facilitate future connection the pipeline will terminate at a new cross. The cross will include a blind flange facing to the west for future connection by UWCD.

It is anticipated that the future connection by UWCD will require the removal of the blind flange and installation of an isolation valve. UWCD will construct conveyance piping directly to a new pumping or flow control station (referred to as the PVCWD Intertie Facility) located on the existing parcel located on the northwest corner of Wood Road and Laguna Road. The parcel (APN 218002062) is owned by PVCWD and used for Well No. 7 which includes an assumed 12-inch connection to the Wood Road transmission main. Well No. 7 includes a pressure transmitter which for the period of January 1st, 2022 to April 15th, 2022 recorded a minimum, maximum and average pressure of 21, 41, and 32 psi respectively. The existing site is at an approximate elevation of 31 feet.

Figure 5-1 provides an illustration of the parcel and proximity to the proposed PVCWD infrastructure point of connection.

Figure 5-1 – UWCD Connection Overview



As shown in **Figure 5-1**, a space could be made available to UWCD. It is anticipated that UWCD would be granted an easement for access and construction of the PVCWD Intertie Facility.

5.2 Controls Overview

The PVCWD Intertie Facility is intended to facilitate transfer of a portion of available flows from either the City's recycled water connection or CWD connection. To this end, the flow controls of the PVCWD Intertie Facility are assumed to operate in the following two modes:

- ***City Recycled Water Mode.*** In this mode the flow control or pumps would be set to convey from the PVCWD distribution system to the UWCD distribution system based on a set percentage of City's recycled water flow. The percentage would be set by PVCWD staff. Flow would be measured at the existing City interconnection and utilized for flow pacing at the PVCWD Intertie Facility.

- ***Conejo Diversion Mode.*** Similar to the City Recycled Water Mode, the flow control or pumps would be set convey water based on a set percentage of CWD diversion water. The percentage would be set by PVCWD staff. Flow would be measured at the existing CWD interconnection and utilized for flow pacing at the PVCWD Intertie Facility.

In addition to flow control, it is anticipated that the PVCWD Intertie Facility would include the following additional protections:

- ***Water Quality.*** PVCWD receives water from various sources which blend within the distribution system and storage reservoir. As such, the quality may vary as demand and sources change. It is anticipated that the PVCWD Intertie Facility would include a conductivity analyzer that could shutdown flow in the event that water quality does not meet UWCD standards.

- ***PVCWD Distribution System.*** To protect PVCWD infrastructure from low system pressure, the PVCWD Intertie Facility is anticipated to include pressure monitoring with a PVCWD determined setpoint. The PVCWD would be shutdown or throttled down if this minimum PVCWD pressure threshold is exceeded.

These assumed operations and controls will be further refined by UWCD in coordination with PVCWD.

5.3 Agency Coordination and Responsibility

The construction and use of the PVCWD Intertie Facility will require, at a minimum, a conveyance agreement and easement between the two parties. The following list of preliminary agency responsibilities is neither comprehensive nor final but is intended to provide a general framework for discussion.

PVCWD Responsibility

- ***Conveyance Control.*** PVCWD will have sole control of setting percentage flows for PVCWD Intertie Facility operation.

- ***Maintain PVCWD Owned Infrastructure.*** PVCWD shall make a reasonable effort to ensure that conveyance infrastructure owned by PVCWD is maintained and operational such that water, when available, can be conveyed.

- ***Monthly Billing***. The conveyance agreement will need to determine the price of water and how billing occurs. Since water may be priced differently for different sources, a means of calculating supply from various sources and accounting for varying billing rates will need to be established. PVCWD will be responsible for monthly billing based on the method defined in the conveyance agreement.

- ***Meter Maintenance***. Since both modes of conveyance rely on measured flow at PVCWD owned connections, it will be the responsibility of the PVCWD to install, calibrate and maintain sufficient flow meters at both the City recycled water connection and CWD diversion connection.

- ***Easement***. PVCWD will be required to provide access and property at the existing PVCWD owned Well No. 7 site. The space allowable will be dependent on maintaining appropriate access for well maintenance and adequate access for the adjacent landowner which shares the PVCWD driveway located off Laguna Road.

<u>UWCD Responsibility</u>

- ***PVCWD Intertie Design, Construction and Maintenance.*** UWCD will be responsible for the permitting, design, construction and maintenance of the PVCWD Intertie Facility, starting at the point of the connection at the PVCWD owned cross to be constructed near the intersection of Wood Road and Laguna Road. This includes all utilities, communication, infrastructure, equipment, site improvements and site security.

- ***PVCWD Intertie Controls.*** UWCD will be responsible for designing, constructing, and maintaining all controls equipment related to the PVCWD Intertie Facility. This includes communication to PVCWD owned flow meters at the City recycled water connection and CWD diversion connection. UWCD will provide adequate equipment for PVCWD to remotely access and/or control operation (i.e. flow control mode or percentage values) from the PVCWD Headquarters Building. UWCD shall provide remote view only access to pressure and flow measurements at the PVCWD Intertie Facility.

- ***PVCWD Coordination.*** PVCWD shall be provided opportunities to review and approve the design prior to construction. The review shall be focused exclusively on consistency with the conveyance agreement.

6.0 FUTURE CONSIDERATIONS

Following acceptance of this PDR, final design will be initiated for the Project. Based on the analysis provided in this PDR, MKN recommends the following items be considered as part of the final design effort:

- ***Corrosion Evaluation (Section 2.4).*** Corrosivity test results presented in the geotechnical report were preliminary. An additional evaluation will be required to assess how concrete structures and utilities should be protected from corrosion, where applicable.

- ***Additional Potholing (Section 2.5).*** Potholing of existing pipelines should be completed during Final Design.

- ***Confirmation of Construction Staging (Section 2.7).*** Construction staging will be estimated and discussed with PVCWD staff. The possibility of using PVCWD owned land will be confirmed and outlined for the Contractor.

- ***Final Design Calculations.*** Final design should include completion and documentation of calculations related to HDD construction, ARV sizing and blowoff sizing.

- ***Environmental Mitigation Measures (Section 4.2).*** The construction schedule should be confirmed to determine need for BIO-1; the balance of mitigation measures recommended should be incorporated in the construction documents.

- ***Construction Sequencing (Section 2.6).*** Consider timing of construction during summer months to minimize potential impacts from shallow groundwater

- *Coordination with County of Ventura*
    a. ***Peak-Hour Restrictions (Section 2.3).*** Standard conditions include peak-hour restrictions for Las Posas Road and may apply to Wood Road and Laguna Road.

    b. ***Open Cut at Las Posas (Section 2.6).*** Jack and Bore construction is currently recommended for the Las Posas Road crossing. Confirmation with County of Ventura that open cut would be acceptable could reduce project cost.

    c. ***Confirm Roadway Moratorium (Section 3.3).*** The moratorium duration on Laguna Road will be determined after confirming if the road improvement was a rehabilitation as opposed to an overlay.

    d. ***Watercourse Protection Permit (Section 4.1).*** Due to the potential duration required to complete this permit, this effort should occur during the final design phase.

7.0 APPENDICES

Appendix A

Environmental Investigation
Rinconc Consultants, Inc.

Groundwater Sustainability Improvement Program

Final Initial Study – Mitigated Negative Declaration

prepared by

Pleasant Valley County Water District
154 South Las Posas Road
Camarillo, California 93010
Contact: Jared Bouchard, General Manager

prepared with the assistance of

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

January 2023

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

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Table of Contents

Tables

Figures

Appendices

Initial Study

1. Project Title

Groundwater Sustainability Improvement Program

2. Lead Agency Name and Address

Pleasant Valley County Water District
154 South Las Posas Road
Camarillo, California 93010

3. Contact Person and Phone Number

Jared Bouchard, General Manager
(805) 482-2119

4. Project Location

The project site is located in unincorporated Ventura County, south of Camarillo and east of Oxnard, and consists of an approximately 9,000-linear-foot pipeline alignment extending along the unpaved road shoulder on the north side of Laguna Road from Wood Road to approximately 350 feet east of Las Posas Road. Figure 1 shows the regional location of the project site, and Figure 2 shows the project alignment at a local scale.

5. Project Sponsor's Name and Address

Pleasant Valley County Water District
154 South Las Posas Road
Camarillo, California 93010

6. General Plan Designation

The project would be located within existing public roadway rights-of-way, which do not have a General Plan designation.

7. Zoning

The project would be located within existing public roadway rights-of-way, which do not have a zoning designation.

8. Description of Project

The Pleasant Valley County Water District's (PVCWD) Groundwater Sustainability Improvement Program (project) includes construction of approximately 9,000 linear feet (LF) of new 18-inch recycled water pipeline that would interconnect two existing transmission laterals located along Wood Road and Las Posas Road, as shown in Figure 2. The purpose of the project is to facilitate ~~increased~~ transfer of existing water supplies available to the both the PVCWD service area and adjacent United Water Conservation District's Pumping Trough Pipeline system, specifically water supplied by the City of Oxnard's Advanced Water Purification Facility and the Conejo Creek Diversion Structure. The project would improve the efficiency and hydraulic capacity of PVCWD's system for blending and conveying water to its existing customers. The project would not enable the use of new water supply sources in the PVCWD service area and does not propose to change existing water use throughout the PVCWD system. The project also does not propose to modify the permits/agreements managed by Camrosa Water District for the Conejo Creek diversion or the City of Oxnard for its Advanced Water Purification Facility.

Construction Activities

Construction would begin around late summer of 2023 and would occur over the course of approximately six months. Construction would occur from 8:00 a.m. to 5:00 p.m., Monday through Friday. Open trenching would be used to install the majority of the pipeline; however, trenchless methods would be used to install the portion of the pipeline that crosses the Las Posas Road Drain, which crosses perpendicular to the alignment, as shown in Figure 2. Trenchless methods may also be used for crossing Las Posas Road to minimize impacts. The two methods used for trenchless installation would be Horizontal Directional Drilling (HDD) and Jack and Bore. The HDD method would involve drilling a hole into the ground at a slight angle from the surface elevation. Once the desired length is drilled, the pipeline would be pulled back through the hole and connected to the open trench installed pipeline. The jacking and receiving pits would be located along the north side of Laguna Road within the road shoulder. The jacking pit would be approximately 36 feet by 12 feet, and the receiving pit would be approximately 12 feet by 12 feet. The maximum depth of excavation would be approximately 6.5 feet. Approximately 4,000 cubic yards of soil would be exported from the site and approximately 3,000 cubic yards of soil would be imported. Construction activities would require a temporary single-lane closure along Laguna Road. Traffic control measures would be implemented during the lane closure, including flaggers at both ends. Construction equipment staging and worker parking would occur along the project alignment.

Operation and Maintenance

Upon completion of construction, the project would not require new operations and maintenance activities or electricity consumption beyond existing PVCWD operations. The anticipated minimum lifetime of the proposed pipeline is 50 years.

9. Surrounding Land Uses and Setting

The project alignment is surrounded primarily by agricultural fields and agro-industrial development to the north, south, west, and east. An agro-industrial facility is located along the project alignment to the north, and one residence along the project alignment is located to the south. The project alignment is bordered by Wood Road to the west and is intercepted by Las Posas Road on the east

end of the alignment. Revolon Slough is located approximately 0.2 mile to the west of the project alignment.

10. Other Public Agencies Whose Approval is Required

PVCWD is the lead agency for this project. The project would also require approval from the California Department of Water Resources Division of Drinking Water, County of Ventura, and Fox Canyon Groundwater Management Agency.

Figure 1 Regional Project Location

Imagery provided by Esri and its licensors © 2022.

Project Location

N

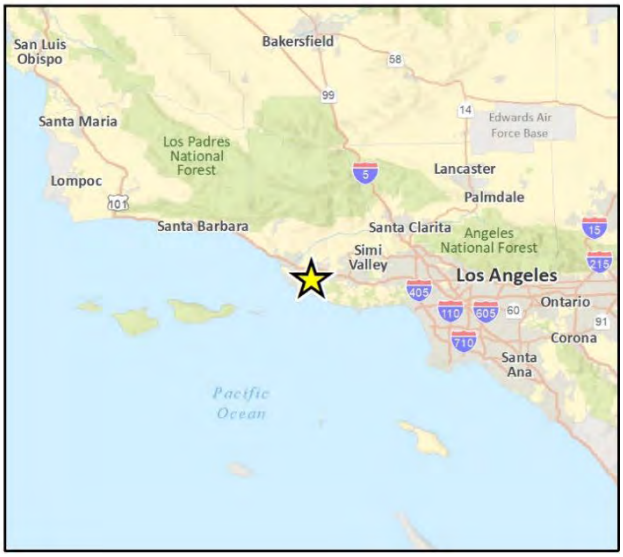
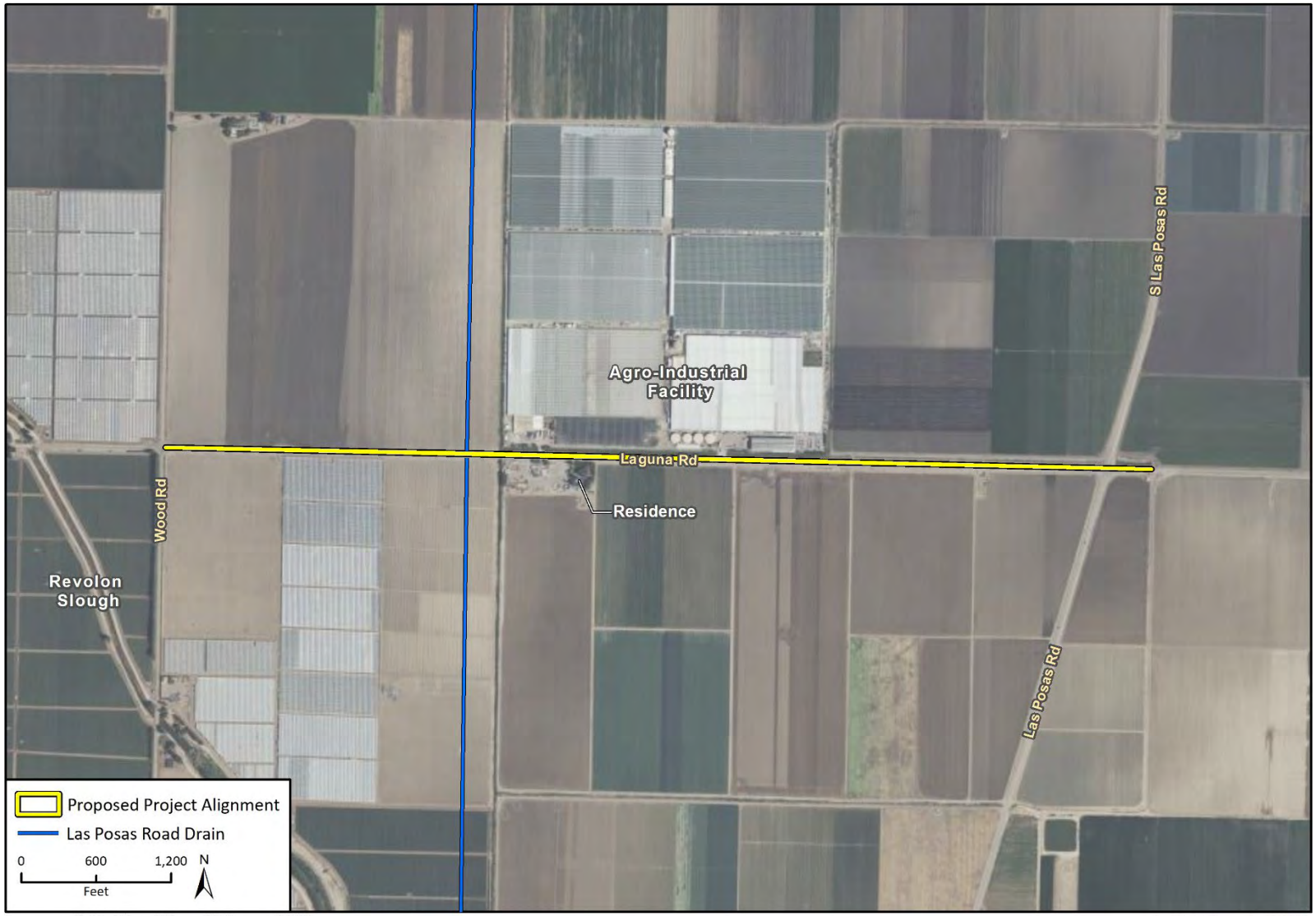


Figure 2 Project Site Location



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Environmental Factors Potentially Affected

This project would potentially affect the environmental factors checked below, involving at least one impact that is "Potentially Significant" or "Less than Significant with Mitigation Incorporated" 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

Determination

Based on this initial evaluation:

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

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

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "less than significant with mitigation incorporated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potential 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, nothing further is required.

Signature

11-3-22
Date

Jared Bouchard
Printed Name

General Manager
Title

Environmental Checklist

1 Aesthetics

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	■
b. Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	■
c. In 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 daytime or nighttime views in the area?	☐	☐	☐	■

a. Would the project have a substantial adverse effect on a scenic vista?

The Ventura County General Plan Conservation and Open Space Element (County of Ventura 2020a) establishes Goal COS-3, which seeks to preserve, protect, and enhance the unique scenic resources in Ventura County, and ensure access to scenic resources within Ventura County for present and future generations. Ventura County offers a variety of scenic resources including panoramic views of the Santa Monica Mountains in the south, northern vistas of the Topatopa mountain range in the Los Padres National Forest, and scenic views of coastal beaches and cliffs in the west (County of Ventura 2020a). Scenic vistas visible from the project site include distant views of the Santa Susana and Santa Monica Mountains. The project would be located entirely underground in the shoulder of an existing roadway ROW. Therefore, the project would have no potential to adversely affect views of scenic vistas in the local area. No impact would occur.

NO IMPACT

b. Would the project substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

State Route (SR) 33, also known as Maricopa Highway, is the closest state-designated scenic highway to the project site (California Department of Transportation [Caltrans] 2019). SR 33 is located approximately 25 miles northwest of the project site, and the project site is not visible from this highway due to distance and intervening topography. The project also does not include removal of trees, modifications to rock outcroppings, or alterations to historic buildings. Given the distance from SR 33 and the nature of project activities, the project would not substantially damage scenic resources within a state scenic highway. Therefore, no impact would occur.

NO IMPACT

c. Would the project, 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?

According to Public Resources Code Section 21071(b), an unincorporated area is considered "urbanized" if 1) the area is completely surrounded by one or more incorporated cities, the total population of the unincorporated area and the surrounding cities is at least 100,000 persons, and the population density of the unincorporated area is at least equal to the population density of the surrounding cities; or 2) the area is located within an urban growth boundary and has an existing residential population of at least 5,000 persons per square mile. The general unincorporated area in which the project site is located is bordered by the city of Oxnard to the west and the city of Camarillo to the north. However, no incorporated cities are located to the south or east of the area. In addition, the project site is located outside the Camarillo Urban Restriction Boundary (City of Camarillo 2016). Therefore, the project site is located in a non-urbanized area.

The project would include installation of an underground pipeline in the shoulder of an existing roadway ROW. Because the pipeline would be located entirely underground, public views of the project site and its surroundings would not change as compared to existing conditions upon the completion of construction. Therefore, the project would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. No impact would occur.

NO IMPACT

d. Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

No nighttime construction or nighttime lighting would be required for the project. Operation of the project would not add reflective surfaces, such as windows or car windshields, or lighting to the project site or its surroundings. Therefore, the project would not create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area, and no impact would occur.

NO IMPACT

2 Agriculture and Forestry Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on 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 12220(g)); timberland (as defined by Public Resources Code Section 4526); or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	■
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	■
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	■

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

b. Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

The project site is located on land designated as Farmland of Statewide Importance, Unique Farmland, and Other Land by the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program (DOC 2016). The project site is zoned Agricultural Exclusive (AE). The project site is not subject to any Williamson Act contracts but is located adjacent to several parcels

zoned for agricultural use and subject to Williamson Act contracts (County of Ventura 2022a). The project would be installed in the ROW of an existing roadway and would not require construction activities within active agricultural fields located adjacent to the alignment. Furthermore, upon completion of construction, the project would be located entirely belowground. Therefore, the project would not convert Farmland to nonagricultural uses or conflict with existing zoning for agricultural uses or a Williamson Act contract. No impact would occur.

NO IMPACT

c. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)); timberland (as defined by Public Resources Code Section 4526); or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

The project site is located in an existing roadway ROW that does not have a General Plan or zoning designation. The project site does not contain forest land or timberland. Therefore, the project would not conflict with existing zoning, or cause rezoning of, for forest land or timberland and would not result in loss of forest land or conversion of forest land to non-forest uses. No impact would occur.

NO IMPACT

e. Would the project 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?

As discussed under thresholds (a) and (b), the project site is located on land designated as Farmland of Statewide Importance, Unique Farmland, and Other Land. However, the proposed pipeline would be installed in the ROW of an existing roadway and would not require construction activities within active agricultural fields located adjacent to the alignment. Therefore, the project would not involve result in the conversion of Farmland to non-agricultural use. In addition, the project site does not contain forest land, so the project would not result in the conversion of forest land to a non-forest use. No impact would occur.

NO IMPACT

3 Air Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	■
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under 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?	☐	☐	■	☐

The project site is located in the South-Central Coast Air Basin (Basin), which covers San Luis Obispo, Santa Barbara, and Ventura counties. The Ventura County Air Pollution Control District (VCAPCD) monitors and regulates the local air quality in Ventura County and manages the Air Quality Management Plan (AQMP). The analysis presented in this section is based upon information found in the Ventura County Air Quality Assessment Guidelines (Guidelines), adopted by the VCAPCD in 2003.

Air quality is affected by stationary sources (e.g., industrial uses and oil and gas operations) and mobile sources (e.g., motor vehicles). Air quality at a given location is a function of several factors, including the quantity and type of pollutants emitted locally and regionally as well as the dispersion rates of pollutants in the region. Primary factors affecting pollutant dispersion are wind speed and direction, atmospheric stability, temperature, the presence or absence of inversions, and topography. The project site is in the southeastern portion of the Basin, which has moderate variability in temperatures, tempered by coastal processes. The air quality in the Basin is influenced by a wide range of emission sources, such as dense population centers, heavy vehicular traffic, industry, and weather.

Air Quality Standards and Attainment

The VCAPCD is required to monitor air pollutant levels to ensure National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) are met. If the standards are met, the Basin is classified as being in "attainment." If the standards are not met, the Basin is classified as being in "nonattainment," and the VCAPCD is required to develop strategies to meet the standards. According to the California Air Resources Board (CARB) Area Designation Maps, Ventura County is designated nonattainment for the ozone NAAQS and CAAQS and nonattainment for the CAAQS for particulate matter measuring 10 microns or less in diameter (PM_{10}) (VCAPCD

2022). To address the region's nonattainment of federal ozone standards, the VCAPCD adopted the 2016 Ventura County AQMP, which provides a strategy for achieving attainment(VCAPCD 2016).

San Joaquin Valley Fever (formally known as Coccidioidomycosis) is an infectious disease caused by the fungus *Coccidioides immitis*. San Joaquin Valley Fever (Valley Fever) is a disease of concern in the Basin. Infection is caused by inhalation of *Coccidioides immitis* spores that have become airborne when dry, dusty soil or dirt is disturbed by natural processes, such as wind or earthquakes, or by human-induced ground-disturbing activities, such as construction, farming, or other activities (VCAPCD 2003). From 2015 to 2019, the number of cases of Valley Fever reported in California averaged 6,614 per year, with an average of 192 cases per year reported in Ventura County (California Department of Public Health 2019). In 2022, 102 Ventura County residents have been identified with suspect, probable, or confirmed cases of Valley Fever through June 30 of this year (California Department of Public Health 2022).

Air Pollutant Emission Thresholds

The VCAPCD's Guidelines recommend specific air pollutant emission threshold levels for determining whether a project may have a significant adverse impact on air quality within the Basin. The project would have a significant impact if operational emissions exceed 25 pounds per day of reactive organic compounds (also referred to as reactive organic gases) or 25 pounds per day of nitrogen oxides. As noted in the Guidelines, the 25 pounds per day threshold for reactive organic compounds and nitrogen oxides is not intended to be applied to construction emissions because such emissions are temporary. Nevertheless, VCAPCD's Guidelines state that construction-related emissions should be mitigated if estimates of reactive organic compounds or nitrogen oxides emissions from heavy-duty construction equipment exceed this threshold (VCAPCD 2003).

The VCAPCD has not established quantitative thresholds for particulate matter for either construction or operation. However, the VCAPCD indicates a project that may generate fugitive dust emissions in such quantities as to cause injury, detriment, nuisance, or annoyance to any considerable number of persons, or which may endanger the comfort, repose, health, or safety of any such person, or which may cause or have a natural tendency to cause injury or damage to business or property, would have a significant air quality impact. This threshold is applicable to the generation of fugitive dust during construction activities. The VCAPCD Guidelines recommend application of fugitive dust mitigation measures to all dust-generating activities. Such measures include minimizing the project disturbance area, watering the site prior to commencement of ground-disturbing activities, covering all truck loads, and limiting on-site vehicle speeds to 15 miles per hour or less.

Applicable VCAPCD Rules and Regulations

The VCAPCD implements rules and regulations for emissions that may be generated by various uses and activities. The rules and regulations detail pollution reduction measures that must be implemented during construction and operation of projects. Relevant rules and regulations to the project include the following:

- **Rule 50 (Opacity).** This rule sets opacity standards on the discharge from sources of air contaminants. This rule would apply during construction of the project.
- **Rule 51 (Nuisance).** This rule prohibits any person from discharging air contaminants or any other material from a source that would cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public or which endangers the comfort, health, safety, or

repose to any considerable number of persons or the public. The rule would apply during construction of the project.

- **Rule 55 (Fugitive Dust).** This rule requires fugitive dust generators, including construction and demolition projects, to implement control measures limiting the amount of dust from vehicle track-out, earth moving, bulk material handling, and truck hauling activities. The rule would apply during construction of the project.
- **Rule 55.1 (Paved Roads and Public Unpaved Roads)**. This rule requires fugitive dust generators to begin the removal of visible roadway accumulation within 72 hours of any written notification from the VCAPCD. The use of blowers is expressly prohibited under any circumstances. This rule also requires controls to limit the amount of dust from any construction activity or any earthmoving activity on a public unpaved road. This rule would apply during construction activities.
- **Rule 55.2 (Street Sweeping Equipment).** This rule requires the use of PM_{10}-efficient street sweepers for routine street sweeping and for removing vehicle track-out pursuant to Rule 55. This rule would apply during construction activities.

Methodology

Air pollutant emissions generated by project construction were estimated using the Roadway Construction Emission (RCEM), version 9.0.0. RCEM uses project-specific information, including the project's land uses, construction equipment parameters, and location, to model a project's construction emissions. The project would not include any operational sources of air pollution; therefore, only construction emissions were modeled. The analysis reflects construction of the project as described under *Project Description*.

Construction emissions modeled include emissions generated by construction equipment used on-site and emissions generated by vehicle trips associated with construction, such as worker and vendor trips. RCEM estimates construction emissions by multiplying the amount of time equipment is in operation by emission factors. It is assumed all construction equipment used would be diesel-powered. This analysis assumes the project would comply with all applicable regulatory standards. In particular, the project would comply with VCAPCD listed above under *Applicable VCAPCD Rules and Regulations*.

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

According to the VCAPCD's Guidelines (2003), a project may be inconsistent with the applicable air quality plan if it would cause the existing population to exceed forecasts contained in the most recently adopted AQMP. The VCAPCD adopted the 2016 Ventura County AQMP to demonstrate a strategy for, and reasonable progress toward, attainment of the federal 8-hour ozone standard. The 2016 Ventura County AQMP relies on the Southern California Association of Governments' (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) forecasts of regional population growth in its AQMP population projections (SCAG 2020).[1]

The proposed project involves construction of a pipeline that would not directly generate population growth through the construction of housing. Given the small-scale nature of project construction activities, it is likely construction workers would be drawn from the existing, regional

[1] On September 3, 2020, SCAG's Regional Council formally adopted the 2020-2045 RTP/SCS (titled Connect SoCal). However, the 2016 AQMP was adopted prior to this date and relies on the demographic and growth forecasts of the 2016-2040 RTP/SCS; therefore, these forecasts are utilized in the analysis of the project's consistency with the AQMP.

workforce and would not indirectly result in the relocation of people to Ventura County. In addition, no new PVCWD employees would be required to operate and maintain the project. Furthermore, the purpose of the project is to facilitate water transfers within PVCWD's existing system and would not result in expanded water supply availability such that population growth would be induced. Therefore, the project would not result in population growth and therefore would not have the potential to conflict with or obstruct implementation of the AQMP. No impact would occur.

NO IMPACT

b. Would the project 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?

The Ventura County portion of the Basin is designated nonattainment for the NAAQs and CAAQS for ozone and the CAAQs for PM_{10} (VCAPCD 2022). The following subsections discuss emissions associated with construction and operation of the proposed project.

Construction

Project construction would generate temporary air pollutant emissions primarily associated with fugitive dust (PM_{10} and $PM_{2.5}$) and exhaust emissions from heavy construction equipment and construction vehicles. Estimated construction emissions are summarized in Table 1. The VCAPCD's 25 pounds per day thresholds for reactive organic compounds and nitrogen oxide do not apply to construction emissions because such emissions are temporary; however, the VCAPCD recommends mitigation be required if reactive organic compounds and nitrogen oxide emissions exceed 25 pounds per day. As shown in Table 1, construction-related and nitrogen oxide emissions would not exceed this level. Therefore, project construction would not result in a cumulatively considerable net increase of any criteria pollutants for which the project region is in nonattainment under applicable federal and state ambient air quality standards. Impacts related to construction emissions would be less than significant.

Table 1 Estimated Maximum Daily Air Criteria Pollutant Emissions - Construction

	Estimated Maximum Daily Emissions (pounds per day)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Activities	1.4	16.7	11.6	<0.1	1.8	0.8

ROG = reactive organic gases; NO_X = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
See Appendix A for air quality modeling results

Operation

The project would not require new operations and maintenance activities within the PVCWD service area upon completion of construction activities. Therefore, no new operational emissions would be generated, and project operation would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. No impact would occur.

LESS THAN SIGNIFICANT IMPACT

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

The VCAPCD defines sensitive receptors as facilities or land uses that include members of the population particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of sensitive receptors listed in the VCAPCD Guidelines (2003) include schools, hospitals, and daycare centers; sensitive receptors also typically include residences. The closest sensitive receptor is a single-family residence located approximately 100 feet to the south of the project site across Laguna Road. The potential for project construction to expose sensitive receptors to substantial pollutant concentrations is discussed in the following subsections. The project does not include any stationary sources of air pollutant emissions, and once construction is complete, the proposed project would not require additional operation and maintenance activities beyond those already occurring to operate and maintain the PVCWD system. Therefore, project operation would not expose sensitive receptors to substantial pollutant concentrations and is not discussed further.

Criteria Pollutant and Fugitive Dust Emissions

As discussed under threshold (b), project construction would result in emissions of criteria pollutants, including fugitive dust, reactive organic compounds, and nitrogen oxides. However, such emissions would be temporary in nature and would be reduced through compliance with existing regulations, such as VCAPCD Rule 55. Furthermore, emissions at a given sensitive receptor would occur for only a limited portion of the overall construction period because project construction would progress across the pipeline alignment, thereby limiting the exposure of any proximate individual sensitive receptor to substantial pollutant concentrations from active construction. Therefore, the project would not expose sensitive receptors to substantial concentrations of criteria pollutant and fugitive dust emissions, and impacts would be less than significant.

Carbon Monoxide Hotspots

Traffic-congested roadways and intersections have the potential to generate elevated localized carbon monoxide levels (i.e., carbon monoxide hotspots). In general, carbon monoxide hotspots occur in areas with poor circulation or areas with heavy traffic. Existing carbon monoxide levels in Ventura County have been historically low enough that VCAPCD monitoring stations throughout the county ceased monitoring ambient carbon monoxide concentrations in March and July of 2004 (VCAPCD 2010). The proposed project would result in a minor increase in vehicle traffic along the project alignment as a result of worker vehicle trips, delivery of heavy-duty equipment and materials, and haul trips during construction. Because the project site is not located in an area with poor circulation or heavy traffic, project-related traffic would not cause or contribute to potential temporary carbon monoxide hotspots. Therefore, the project would not expose sensitive receptors to substantial concentrations of carbon monoxide, and impacts would be less than significant.

Toxic Air Contaminants

Toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs generally consist of four types: organic chemicals, such as benzene, dioxins, toluene, and perchloroethylene; inorganic chemicals such as chlorine and arsenic; fibers such as asbestos; and metals such as mercury, cadmium, chromium, and nickel. The primary TAC emitted by project implementation would be diesel particulate matter (DPM) generated by heavy-duty equipment and

diesel-fueled delivery and haul trucks during construction activities. DPM was identified as a TAC by the CARB in 1998 and is primarily composed of PM_{10} and $PM_{2.5}$ exhaust emissions (CARB 2022).

Generation of DPM from construction projects typically occurs in a single area for a short period. Construction of the proposed project would occur in phases over approximately six 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 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 California Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project. Thus, the duration of proposed construction activities (i.e., six months) is approximately 0.7 percent of the total exposure period used for health risk calculation. Current models and methodologies for conducting health-risk assessments are associated with longer-term exposure periods of nine, 30, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities, resulting in difficulties in producing accurate estimates of health risk (BAAQMD 2017).

Maximum DPM emissions would occur during site preparation and grading construction activities. DPM emissions would be lower during other construction phases such as paving and site restoration because these phases would require less construction equipment. While the maximum DPM emissions associated with site preparation and grading would only occur for approximately 2.4 months, or 40 percent of the overall construction period, these activities represent the worst-case condition for the total construction period. This would represent less than 0.3 percent of the total exposure period for health risk calculation. Therefore, project construction activities would not represent the type of long-term TAC emission sources typically subject to health risk assessments. Construction activities would also be subject to and would comply with California regulations limiting the idling of heavy-duty construction equipment to no more than five minutes, which would further reduce nearby sensitive receptors' exposure to temporary and variable DPM emissions. Compliance with the standard construction measures required by the VCAPCD would also further reduce nearby sensitive receptors' exposure to temporary and variable DPM emissions. As such, project construction would not expose sensitive receptors to substantial TAC concentrations, and impacts would be less than significant.

San Joaquin Valley Fever

Construction activities, including site preparation and grading, would have the potential to release *Coccidioides immitis* spores. Nonetheless, the population of Ventura County has been and will continue to be exposed to Valley Fever from agricultural and construction activities occurring throughout the region. In addition, substantial increases in the number of reported cases of Valley Fever tend to occur only after major ground-disturbing events such as the 1994 Northridge earthquake (VCAPCD 2003). Construction of the proposed project would not result in a comparable major ground disturbance, and because of compliance with VCAPCD Rule 55 (Fugitive Dust), the project would not release a large number of spores. The VCAPCD does not have a recommended threshold for Valley Fever Impacts but instead recommends consideration of the following factors that may indicate a project's potential to result in significant impacts related to Valley Fever:

- Disturbance of the topsoil of undeveloped land (to a depth of about 12 inches)
- Dry, alkaline, sandy soils
- Virgin, undisturbed, non-urban areas
- Windy areas
- Archaeological resources probable or known to exist in the area (Native American midden sites)
- Special events (fairs, concerts) and motorized activities (motocross track, All Terrain Vehicle activities) on unvegetated soil (non-grass)
- Non-native population (i.e., out-of-area construction workers)

The project would require disturbance of the topsoil of undeveloped land to a depth of approximately 6.5 feet in a non-urban area with soils composed of Camarillo sandy loam, Camarillo loam, Camarillo loam - sandy substratum, Hueneme sandy loam, and Riverwash (United States Department of Agriculture 2022). Due to the relatively small size of the proposed project, it is anticipated construction workers would be from the local or regional area and would therefore have previous exposure to and immunity from Valley Fever. In addition, the project alignment is located in an area that has been previously disturbed and continues to be disturbed in conjunction with construction and maintenance of the roadway, drainage ditches, and other nearby agro-industrial development. The project site is also located in a rural area with very few sensitive receptors nearby. Furthermore, due to the nature of the project, ground disturbance would be relatively minimal and limited to the trench area and drill pits in which the pipeline is installed. Therefore, construction of the proposed project would not result in a substantial increase in entrained fungal spores that cause Valley Fever above existing background levels, and impacts related to Valley Fever would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Project construction could generate odors associated with heavy-duty equipment operation and earth-moving activities. Such odors would be temporary in nature and limited to the duration of construction in the vicinity of the project site. The project contractor(s) would also be required to adhere to VCPACD Rule 51 (Nuisance), which prohibits discharge of air contaminants or any other material from a source that would cause nuisance to any considerable number of persons or the public, including odor. Project operation would involve conveyance of water via an underground pipeline and would not result in the generation of odors. Therefore, the project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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4 Biological Resources

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

This biological analysis is based on the results of a desktop and database review of the project region and a reconnaissance-level biological survey of the project site.

The following resources were analyzed in the desktop/database review: United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation system (USFWS 2022b), USFWS Critical Habitat Portal (USFWS 2022a), USFWS National Wetland Inventory (USFWS 2022c), United States Geological Survey (USGS) National Hydrography Dataset (USGS 2022a), California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2022a), CDFW Biogeographic Information and Observation System (BIOS) (CDFW 2022b) and California Native Plant Society (CNPS) Online Inventory of Rare, Threatened and Endangered Plants of California (CNPS 2022). The CNDDB review focused on a query of biological resources previously documented within a five-mile radius around the project site. The query of the CNPS database included nine quadrangles surrounding the project site, including the following USGS 7.5-minute topographic quadrangles: *Camarillo, Newbury Park, Triunfo Pass, Point Mugu, Point Mugu OE W, Oxnard, Saticoy, Santa Paula,* and *Moorpark, California*. The review also analyzed available historical aerial imagery via Google Earth Pro and digitally available historical topographic imagery (USGS 2022b). The desktop/database review evaluated the potential for the project site to support special-status species, aquatic resources, and sensitive natural vegetation communities and assessed the potential for the project to result in significant impacts to these resources.

The field survey was conducted by a Rincon biologist on July 8, 2022, between 10:30 a.m. and 2:00 p.m., and included the project site and a 50-foot buffer (herein referred to as the "biological study area"). At the time of the survey, weather conditions included temperatures between 68 and 74 degrees Fahrenheit, partially cloudy skies, and a slight breeze. The purpose of the field survey was to document the existing biological conditions, including all plant and wildlife species, vegetation communities, land cover types, potentially suitable habitat for regionally occurring wildlife, and aquatic resources. The extents of vegetation communities, land cover types, aquatic resources, and special-status biological resources were mapped using a Geode Geographic Positioning System (GPS) with sub-meter accuracy and plotted on aerial imagery. Vegetation community classification was conducted using the systems provided in *A Manual of California Vegetation, Second Edition* (MCV2; Sawyer et al. 2009), in conjunction with the CDFW California Sensitive Natural Communities List (CDFW 2022c). Land covers were characterized for areas that are unvegetated or dominated by ornamental vegetation (e.g., disturbed/developed).

Existing Conditions

Based on the results of the desktop/database review and field survey, the biological study area can generally be described as a disturbed roadside along Laguna Road. Two agricultural drainage ditches occur in the biological study area, one parallel to Laguna Road and one perpendicular to Laguna Road, crossing underneath it. The biological study area is generally flat and includes paved roads and driveways, unpaved road shoulders, agricultural fields, and ornamental vegetation. Elevations within the biological study area range from approximately 20 to 35 feet above mean sea level.

Plant and wildlife species observed in the biological study area were documented (see Table 1 and Table 2 in Appendix B). One special status wildlife species was observed near the eastern extent of the biological study area: California horned lark (*Eremophila alpestris actia*). This species is on the CDFW Watch List (WL), which is a list of species identified by CDFW as taxa that were either previously designated as a Species of Special Concern (SSC) but no longer merit that status or which do not yet meet SSC criteria but for which there is concern and a need for additional information to clarify status. No other special-status species were observed in the biological study area.

Three vegetation communities and one land cover type were documented in the biological study area and are shown on Figure 3 through Figure 5. These communities and land cover types include the following:

- Fields of fat hen (*Atriplex prostrata*), an Association of Fields of fat hen and brass buttons (*Atriplex prostrata – Cotula coronopifolia* Herbaceous Semi-Natural Alliance)
- Cattail marshes (Typha [angustifolia, domingensis, latifolia] Herbaceous Alliance)
- Bermudagrass – prickle grass – crowngrass turfs (*Cynodon dactylon – Crypsi*s spp. – *Paspalum* spp. Herbaceous Semi-Natural Alliance)
- Disturbed/Developed

The fields of fat hen vegetation community is characterized by a dense herbaceous layer dominated by fat hen (*Atriplex prostrata*). The cattail marshes are dominated by narrowleaf cattail (*Typha domingensis*), rabbitsfoot grass (*Polypogon monspeliensis*), and summer mustard (*Hirschfeldia incana*). Bermudagrass – prickle grass – crowngrass turfs is characterized by a dense herbaceous layer dominated by rabbitsfoot grass (*Polypogon monspeliensis*), a non-native invasive species, with occurrences of fat hen, ditch beard grass (*Polypogon interruptus*), and sprangletop (*Leptochloa fusca*). These three vegetation communities were identified within the agricultural drainage ditches in the biological study area. Due to the regular maintenance activities in the drainage ditches, herbicide impacts, and disturbance from the adjacent road and nearby residential and commercial development, the quality of the habitat occurring in these ditches is considered marginal and may only support common wildlife foraging for short durations. None of the vegetation communities identified in the study area considered sensitive by CDFW (2022c).

The remaining portions of the biological study area can be characterized as disturbed/developed land cover, which includes paved roads and driveways, agricultural fields, ornamental shrubs, and unpaved gravel or hardpacked dirt with little to no vegetation. Few ornamental trees were observed, including Peruvian pepper trees (*Schinus molle*) and cotoneaster (*Cotoneaster* sp.). A few coast live oak (*Quercus agrifolia*) trees were also observed in the biological study area; however, no trees were observed in the proposed project work areas. Some herbaceous plants are present on the unpaved road shoulders and banks of the two agricultural ditches; however, these plants appear to be regularly removed using herbicide and mechanical methods and do not constitute a vegetation community.

Figure 3 Biological and Potentially Jurisdictional Resources – Western Extent

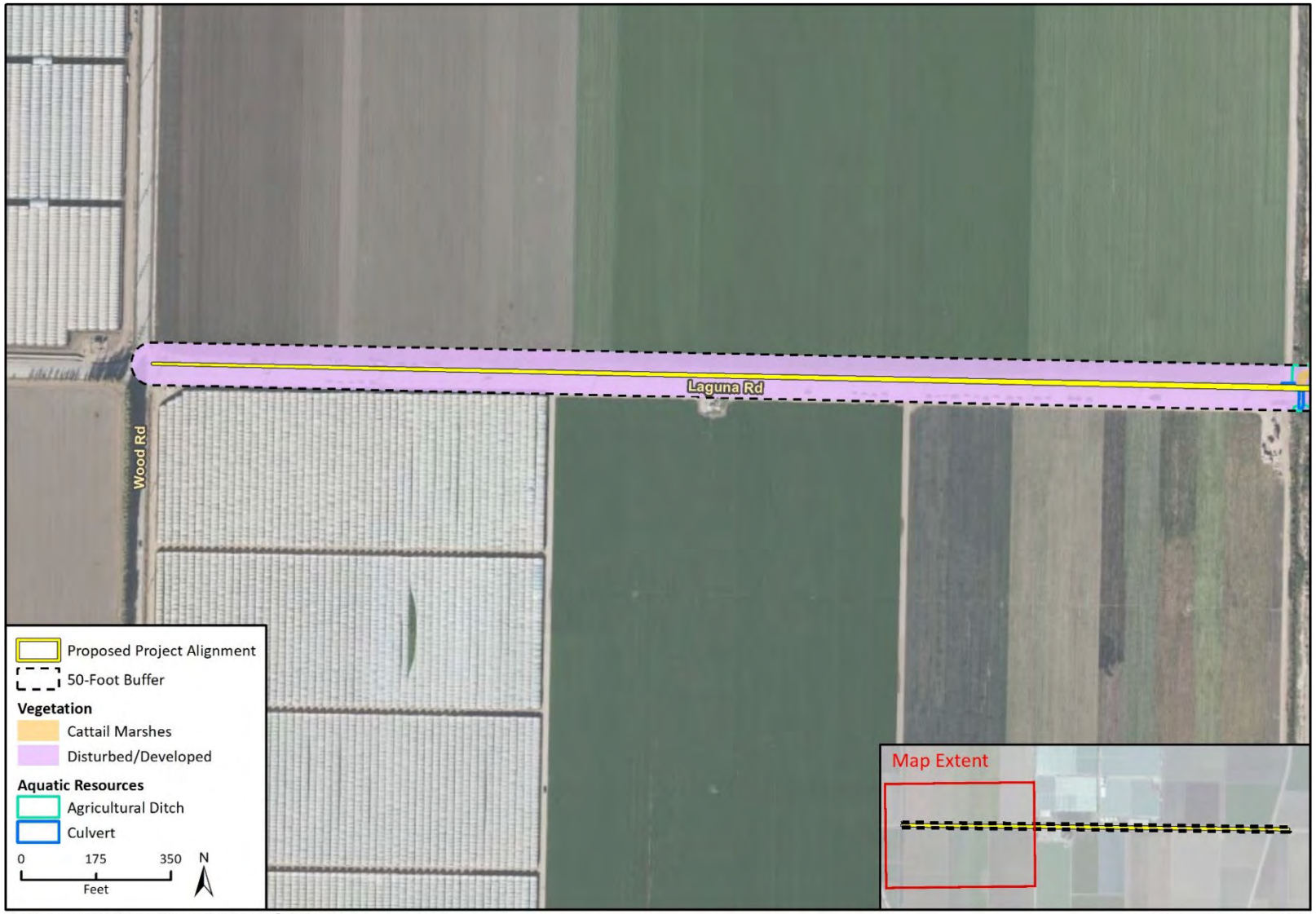


Figure 4 Biological and Potentially Jurisdictional Resources – Central Extent

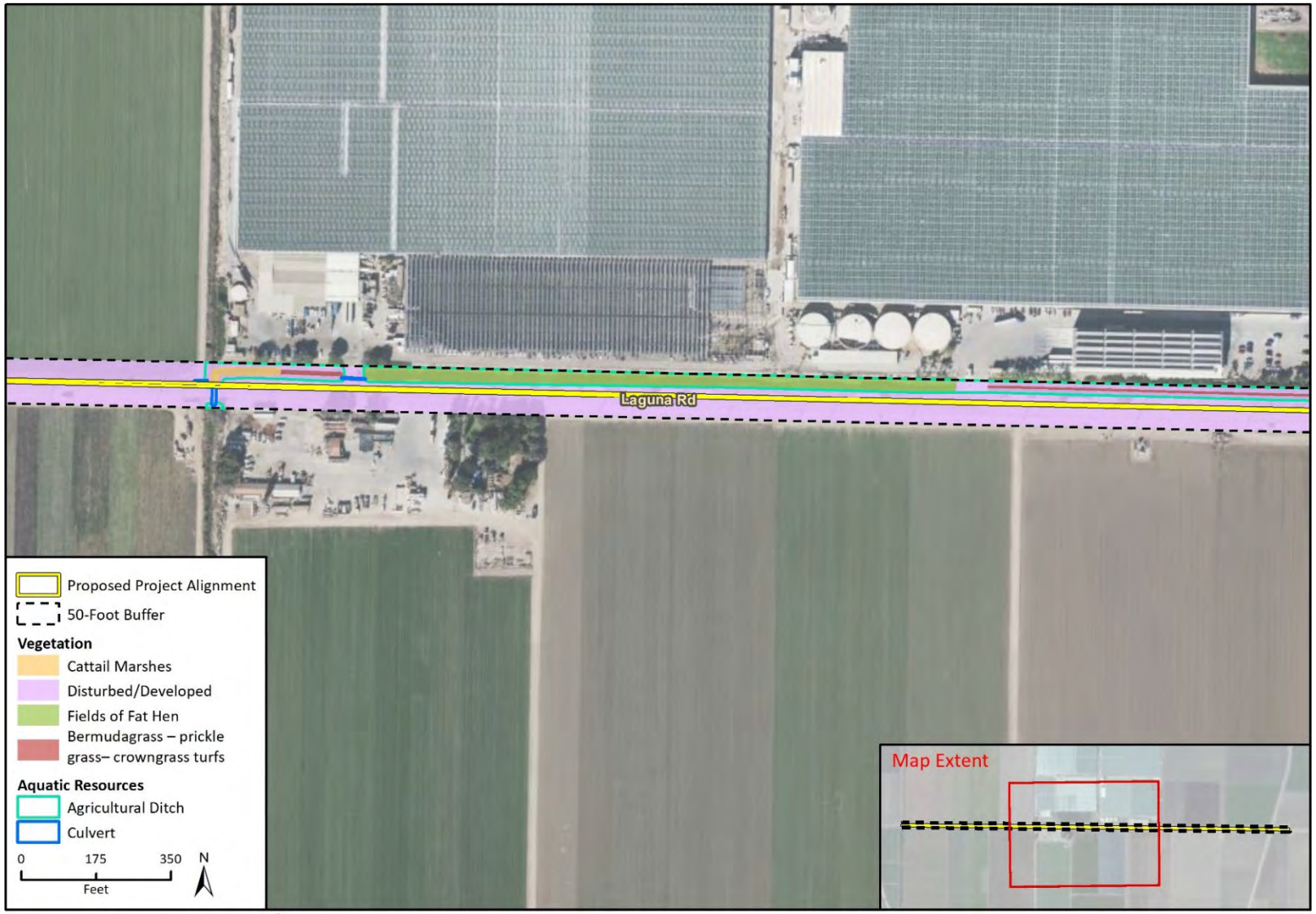
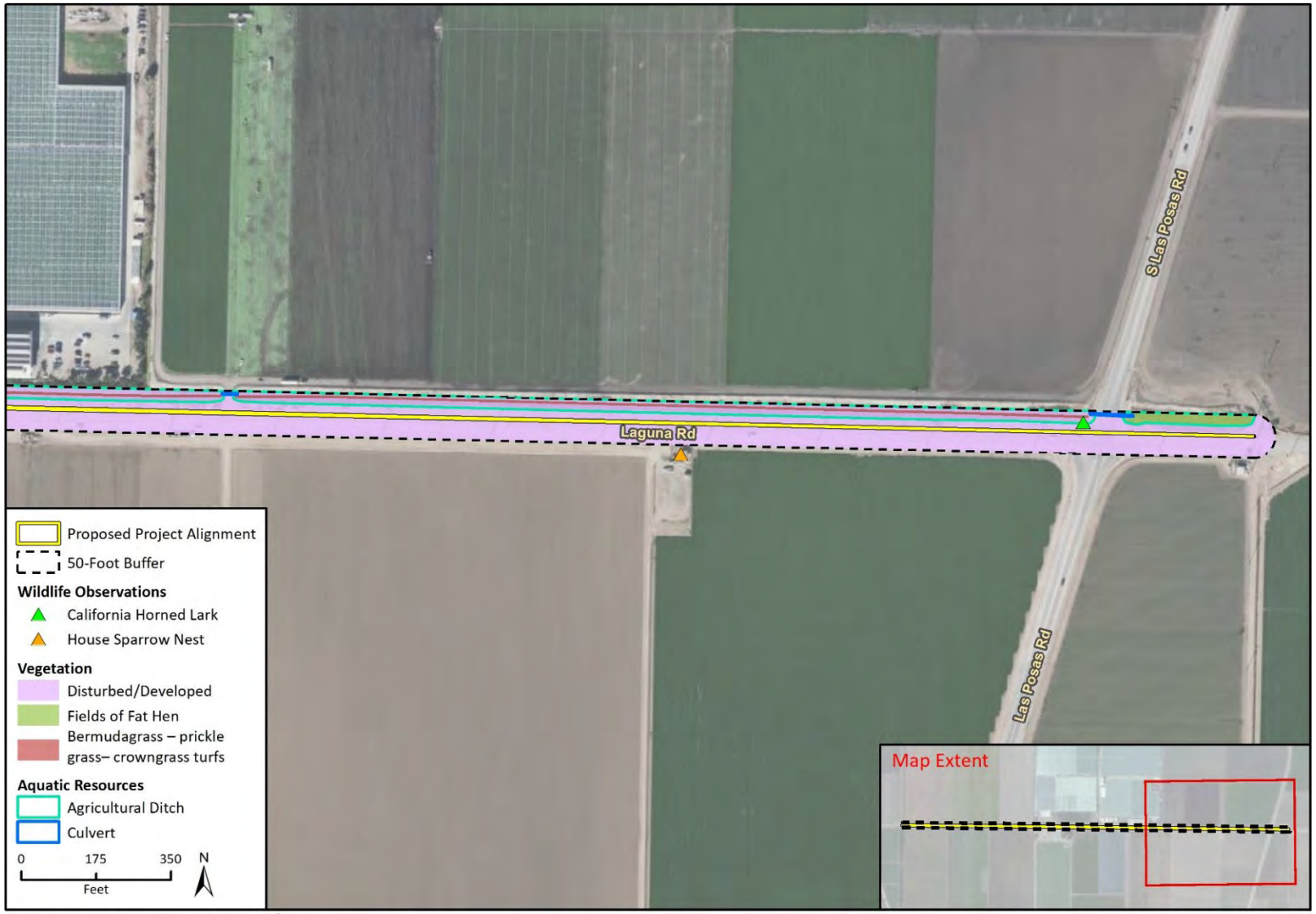


Figure 5 Biological and Potentially Jurisdictional Resources – Eastern Extent



The two unnamed agricultural ditches occurring within the biological study area consist of steep dirt banks with sparse vegetation and flat channel bottoms. Aquatic life including algae, aquatic insects, and small fish were observed in the ditches; however, the ditches were significantly disturbed by trash and herbicide/pesticides. One agricultural ditch runs in an east-west direction parallel to the project alignment, along the northern side of Laguna Road, beginning east of Las Posas Road, where water outlets from a pipe. This east-west ditch extends through most of the biological study area, before intersecting with the second ditch, which runs north to south. The east-west agricultural ditch is approximately 10 feet deep and 20 to 30 feet wide, from bank to bank. The channel bottom is 6 to 10 feet wide and contains water to a depth of 6 to 12 inches. The east-west ditch flows through several culverts in the biological study area, which direct it under existing access roads. The north-south agricultural ditch crosses the biological study area via a culvert under Laguna Road. This ditch is approximately 40 feet wide from bank to bank and 10 feet deep. The channel bottom is approximately 20 feet wide and contains water to a depth of approximately one foot.

The project site is located within the Revolon Slough-Calleguas Creek Watershed (Hydrologic Unit Code 12180701030107). Revolon Slough is located approximately 1.2 miles downstream of the biological study area and ultimately meets with Calleguas Creek, which then discharges into Mugu Lagoon and the Pacific Ocean. The two unnamed agricultural ditches within the biological study area receive all of their water from nearby agricultural activities. In review of the historical USGS topographic imagery that illustrates blue-line streams, the ditches were constructed from upland habitat sometime between 1904 and 1942 to support agricultural activities. The ditches are maintained by the Revolon Drainage Corporation, which was founded in 1953 (Arnold 2022).

a. Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Based on the desktop/database review of the project region, field observations, and review of potentially suitable habitat within the survey area, no special-status plants were observed or previously documented. In addition, none are expected to occur on the project site or in the nearby vicinity based on the lack of suitable habitat and disturbed nature of the site.

One special-status wildlife species was observed in the biological study area during the field survey – the California horned lark. Other special-status wildlife determined to have a potential for occurrence, primarily due to the marginal aquatic habitat occurring in the agricultural ditches, include western pond turtle (*Emys marmorata*; CDFW SSC), arroyo chub (*Gila orcuttii*; CDFW SSC), and two-striped gartersnake (*Thamnophis hammondii*; CDFW SSC). The two agricultural ditches were observed during the field survey to support some water and aquatic life, including algae, aquatic insects, and small fish that may provide habitat. However, during the field survey, a portion of the water in the ditches was dyed blue, and a significant amount of trash was accumulated. Therefore, the potential for these species to occur in biological study area is very low. Furthermore, the project does not include any disturbance to the agricultural ditches that may support potentially suitable habitat for these species. Therefore, no impacts to these species would occur. Other special-status wildlife previously documented in the vicinity, based on the desktop/database review, were determined to have no potential for occurrence based on lack of suitable habitat and disturbed nature of the site. As such, special-status wildlife expected to occur within the project site are limited to the California horned lark. The project could directly (e.g., via direct mortality or vegetation removal) and indirectly (e.g., via construction noise and motion) impact this species.

Impacts to California horned lark would be potentially significant, and implementation of Mitigation Measure BIO-1 would be required to reduce impacts to a less-than-significant level.

The biological study area may also support nesting birds, including raptors, and are protected under the California Fish and Game Code Sections 3503, 3503.5, and 3513 and the Migratory Bird Treaty Act (16 United States Code Sections 703 to 712). While common birds are not designated as special-status species, unlike the California horned lark observed in the survey area, destruction of all native bird eggs, nests, and nestlings is prohibited by federal and state law. Established ornamental trees within the biological study area, bare ground, shrubs, and grasses on site could provide nesting areas. The project could directly (e.g., via vegetation removal) and indirectly (e.g., via construction noise and motion) impact nesting birds; therefore, impacts would be potentially significant, and implementation of Mitigation Measure BIO-1 would be required to reduce impacts to a less-than-significant level.

Mitigation Measure

BIO-1 Nesting Bird Pre-Construction Survey and Avoidance Buffers

Project construction activities shall commence outside of the bird breeding season (February 1 to August 31) to the extent practicable. If construction must commence within the bird breeding season, then a nesting bird pre-construction survey shall be conducted by a qualified biologist within the disturbance footprint plus a 300-foot buffer, where feasible, no more than 14 days prior to initiation of ground disturbance and/or vegetation removal. If construction activities stop for more than two weeks during the bird breeding season, a subsequent pre-construction nesting bird survey shall be completed no more than 14 days prior to the re-initiation of construction, should it re-commence during the bird breeding season.

Pre-construction nesting bird surveys shall be conducted during a time of day when birds are active and shall factor in sufficient time to perform the survey adequately and completely. A report of the nesting bird survey results, if applicable, shall be prepared and serve as documentation of results.

If no nesting birds are observed during the pre-construction survey, no further action is necessary. If nests are found, their locations shall be flagged to facilitate avoidance. An appropriate avoidance buffer of 150 feet for passerines and up to 300 feet for raptors, and depending on the proposed work activity, shall be determined by a qualified biologist and demarcated with bright orange construction fencing or other suitable flagging. Active nests shall be monitored at a minimum of once per week until it has been determined that the nest is no longer being used by either the young or adults. No ground disturbance shall occur within the buffer(s) until the qualified biologist confirms the breeding/nesting is completed and all the young have fledged. If construction activities must occur within the buffer, they shall be conducted at the discretion of the qualified biologist.

Significance after Mitigation

Mitigation Measure BIO-1 would achieve compliance with federal and state laws through the implementation of a pre-construction nesting bird survey if construction occurs during the nesting bird season (typically February 1 to August 31). If active nests are identified, avoidance buffers would be established to minimize impacts to nesting birds until nests are no longer active. Therefore, implementation of Mitigation Measure BIO-1 would reduce impacts to special-status species, including California horned lark, and nesting birds to a less-than-significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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

The agricultural ditches within the biological study area support riparian habitat in the form of hydrophytic vegetation within the fields of fat hen, cattail marshes, and rabbitsfoot grass turfs. However, these communities would not be impacted by the proposed project because they are located outside the proposed work areas. Therefore, the project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS. No impact would occur.

NO IMPACT

c. Would the project 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?

The two agricultural ditches occurring in the biological study area support water flow from agricultural activities, aquatic vegetation, aquatic insects, and small fish. The ditches also connect to downstream waters that eventually flow to the Pacific Ocean. The ditches may be provided state and federal protection; however, the proposed project would avoid direct removal and hydrological interruption of the two agricultural ditches because project construction would not encroach into the east-west ditch and trenchless methods would be used to install the pipeline under the north-south ditch. However, project construction could indirectly impact these features if erosion, spills, or leaks occur such that sediment or other contaminants enter the ditches. Therefore, the project would result in potentially significant impacts to aquatic resources that may be under state and federal protection, and implementation of Mitigation Measure BIO-2 would be required to reduce impacts to a less-than-significant level. Implementation of Mitigation Measure HAZ-1, outlined in Section 9, *Hazards and Hazardous Materials*, would further reduce impacts associated with the potential for reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment to impact the two agricultural ditches.

Mitigation Measure

BIO-2 Avoidance Buffers and Best Management Practices for Aquatic Resources

Project construction activities shall maintain a 10-foot buffer from the top of the bank of the agricultural ditches. In addition, the following best management practices shall be implemented during project construction:

- Prior to the start of project activities, all limits of construction work adjacent to the ditches shall be clearly delineated with orange construction fencing or similar highly visible material to be maintained throughout the duration of construction.
- Any material/spoils generated from project activities shall be located away from the ditches to the extent practicable and protected from stormwater run-off using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate.
- Materials shall be stored on impervious surfaces or plastic ground covers to prevent spills or leakage from contaminating the waters and vegetation communities within the ditches.

- Any spillage of material shall be stopped if it can be done safely. The contaminated area shall be cleaned and any contaminated materials properly disposed of.
- All vehicles and equipment shall be in good working condition and free of leaks.
- Erosion control measures shall be implemented around active work areas, and only natural-fiber, biodegradable meshes and coir rolls, (i.e., no plastic-mesh temporary erosion control measures) shall be used.
- Trenches or pits that remain unfilled shall be secured at the end of each construction workday.
- Equipment and vehicle parking, driving, and storage as well as materials laydown and stockpiling shall be limited to previously compacted and developed areas to the extent practicable.
- Disturbances to native vegetation shall be minimized to the extent practicable.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Would the project 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?

Wildlife corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as between foraging and denning areas, or they may be regional in nature, allowing movement across the landscape. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

The habitats in the linkage do not necessarily need to be the same as the habitats being linked. Rather, the linkage merely needs to contain sufficient cover and forage to allow temporary inhabitation by ground-dwelling species. Typically, habitat linkages are contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Depending upon the species using a corridor, specific physical resources (e.g., rock outcroppings, vernal pools, or oak trees) may need to be in the habitat link at certain intervals to allow slower-moving species to traverse the link. For highly mobile or aerial species, habitat linkages may be discontinuous patches of suitable resources spaced sufficiently close together to permit travel along a route in a short period of time.

The project site is not situated within documented wildlife corridors or habitat linkages (Spencer et. al. 2010). Within the project site, there are significant barriers to wildlife movement including the surrounding agricultural fields and a network of paved and dirt agricultural roads fragmenting the landscape. Agricultural ditches within the biological study area may provide passage for wildlife movement in the surrounding region; however, the project would be located outside the limits of the east-west ditch and would be installed underneath the north-south ditch via trenchless construction methods. Therefore, the project would not 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. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The biological study area is located in unincorporated Ventura County but is not within the coastal zone or any defined Environmentally Sensitive Habitat Areas. The proposed project work areas do not include wetland resources, sensitive habitats, or protected trees. Therefore, the proposed project would not conflict with local policies and ordinances protecting biological resources, and no impact would occur.

NO IMPACT

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project site is not located in the planning area for any adopted local, regional, or state Natural Community Conservation Plans or Habitat Conservation Plans. Therefore, the project would not conflict with the provisions of any such plan, and no impact would occur.

NO IMPACT

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5 Cultural Resources

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

Rincon prepared a Phase 1 Cultural Resources Letter Report to evaluate potential project impacts to historical and archaeological resources (Pfeiffer et al. 2022). The report included the results of a California Historical Resources Information System records search, archival research, a Sacred Lands File (SLF) search conducted by the Native American Heritage Commission (NAHC), and a pedestrian field survey. The following analysis is based on the Phase 1 Cultural Resources Letter Report, which is provided as a redacted version in Appendix C.

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

Public Resources Code (PRC) Section 21084.1 requires a lead agency determine whether a project could have a significant effect on historical resources. A historical resource is a resource listed in or determined to be eligible for listing in the California Register of Historical Resources (CRHR) (PRC Section 21084.1), a resource included in a local register of historical resources (PRC Section 15064.5[a][2]), or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (PRC Section 15064.5[a][3]).

A resource shall be considered historically significant if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. 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
4. Has yielded, or may be likely to yield, information important in prehistory or history.

A search of the California Historical Resources Information System at the South Central Coastal Information Center located at California State University, Fullerton was completed on May 18, 2022. The search was performed to identify previously recorded cultural resources as well as previously

conducted cultural resources studies within the project site and a 0.5-mile radius surrounding it. Rincon also reviewed the National Register of Historic Places, the CRHR, the California Historical Landmarks list, and the Built Environment Resources Directory, as well as its predecessor the California State Historic Property Data File. Results of these searches indicated no known historical resources are located within or near the project site (Appendix C). The Ventura County Resource Management Agency identified the property located at 582-94 Laguna Road (Assessor's Parcel Number 230-0-072-280) as a potentially eligible County of Ventura Cultural Heritage Site. This property was previously included within the *Eastern Oxnard Plain Historic Context & Reconnaissance Survey*, prepared by San Buenaventura Research Associates in December 2014.[2] According to this report, the residence and outbuildings were attributed to the 1898 to 1945 time period and associated with the Settlement and Agriculture context themes. On July 1, 2022, Rincon conducted a pedestrian field survey and identified no previously unknown historical resources within the project site (Appendix C).

The project would be constructed in the public right-of-way of Laguna Road outside of the 582-94 Laguna Road property and would not affect the residence or outbuildings of this potentially eligible County Cultural Heritage Site. Once construction is complete, the project would be located entirely belowground and thus would not change the visual setting of this property. As a result, the project would not have the potential to cause a substantial adverse change in the potential historical significance of the 582-94 Laguna Road property because no physical demolition, destruction, relocation, or alteration of this property or its immediate surroundings would occur such that the significance of this potential historical resource would be materially impaired. ~~Because no historical resources exist on the project site~~ Therefore, the project would not result in a substantial adverse change to the significance of a historical resource, and no impact would occur.

NO IMPACT

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

CEQA Guidelines Section 15064.5 defines significant archaeological resources as resources that meet the criteria for historical resources or resources that constitute unique archaeological resources. A significant impact could occur if the proposed project would significantly affect archaeological resources that fall under either of these categories.

If it can be demonstrated a project would cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent resources cannot be left undisturbed, mitigation measures are required (PRC Section 21083.2[a-b]).

PRC Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated, without merely adding to the current body of knowledge, there is a high probability that it:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;

[2] San Buenaventura Research Associates. 2014. Eastern Oxnard Plain Historic Context & Reconnaissance Survey https://docs.vcrma.org/images/pdf/planning/programs/chb/East-Oxnard-Plain-Context-12-2014.pdf (accessed December 2022).

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

The records search conducted did not identify any known archaeological resources within the project site or vicinity. Results of the NAHC SLF search also did not indicate any known Native American resources near the project site (Appendix C). A dispersed, low-density scatter of approximately 60 highly fragmented, marine clam shells was identified along an approximately 300-foot segment of the proposed project alignment during the pedestrian field survey. The origin of the marine clam shell is unknown. No prehistoric cultural materials such as flaked stone or animal bone were identified in association with the shell. Although the project site has been previously disturbed from roadway construction and underground utility installation, the presence of marine shells along the proposed alignment suggests there is potential for encountering subsurface archaeological deposits during project-related ground disturbances. Although the origin of the shell is unknown and there is no clear indication the shell is cultural, potential impacts to archaeological resources could occur in the event archaeological resources are unexpectedly discovered during project construction (Appendix C). Therefore, the project would potentially cause a substantial adverse change in the significance of an archaeological resource, and implementation of Mitigation Measures CR-1 and CR-2 would be required.

Mitigation Measures

CR-1 Worker's Environmental Awareness Program

A qualified archaeologist shall be retained to conduct a Worker's Environmental Awareness Program training on archaeological sensitivity for all construction personnel prior to the commencement of ground-disturbing activities. The training shall be conducted by a qualified archaeologist who meets the Secretary of Interior's Professional Qualification Standards for archaeology (National Park Service 1983). Archaeological sensitivity training shall include a description of the types of cultural material that may be encountered, cultural sensitivity issues, the regulatory environment, and the proper protocol for treatment of the materials in the event of a find.

CR-2 Unanticipated Discovery of Cultural Resources

If archaeological resources are unexpectedly encountered during project-related ground-disturbing activities, work in the immediate area shall be halted and a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the find. If the find is prehistoric, then a Native American representative shall also be contacted to participate in the evaluation of the find. If necessary, the evaluation may require preparation of a treatment plan and archaeological testing for CRHR eligibility. If the discovery proves to be eligible for the CRHR and cannot be avoided by the proposed project, additional work, such as data recovery excavation, may be warranted to mitigate any significant impacts to historical resources.

Significance after Mitigation

Mitigation Measures CR-1 and CR-2 would minimize the potential for impacts related to unexpected discoveries of archaeological resources to occur through the implementation of a Worker's Environmental Awareness Program training prior to construction and appropriate procedures for

evaluation and treatment should any discoveries be made during construction. Therefore, implementation of Mitigation Measures CR-1 and CR-2 would reduce impacts to archaeological resources to a less-than-significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

No human remains are known to be present within the project site (Appendix C). However, the discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, California Health and Safety Code Section 7050.5 states no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately by PVCWD. If the human remains are determined to be of Native American origin, the Coroner will notify the NAHC, which will determine and notify a most likely descendant (MLD). The MLD has 48 hours from being granted site access to make recommendations for the disposition of the remains. If the MLD does not make recommendations within 48 hours, the landowner shall reinter the remains in an area of the property secure from subsequent disturbance. With adherence to existing regulations, impacts to human remains would be less than significant.

LESS THAN SIGNIFICANT IMPACT

6 Energy

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

As a state, California is one of the lowest per capita energy users in the United States, ranked 49th in the nation, due to its energy efficiency programs and mild climate (United States Energy Information Administration 2022). Electricity and natural gas are primarily consumed by the built environment for lighting, appliances, heating and cooling systems, fireplaces, and other uses such as industrial processes in addition to being consumed by alternative fuel vehicles. The project would not result in a net increase in electricity usage in the PVCWD service area as compared to existing conditions and would not include natural gas connections. Therefore, electricity and natural gas consumption are not discussed further in this analysis.

Petroleum fuels are primarily consumed by on-road and off-road equipment in addition to some industrial processes, with California being one of the top petroleum-producing states in the nation (CEC 2021). Gasoline, which is used by light-duty cars, pickup trucks, and sport utility vehicles, is the most used transportation fuel in California with 13.8 billion gallons sold in 2021 (CEC 2022a). Diesel, which is used primarily by heavy duty-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm equipment, and heavy-duty construction and military vehicles, is the second most used fuel in California with 1.8 billion gallons sold in 2019 (CEC 2022b).

Energy consumption is directly related to environmental quality in that the consumption of nonrenewable energy resources releases criteria air pollutant and greenhouse gas (GHG) emissions into the atmosphere. The environmental impacts of air pollutant and GHG emissions associated with the project's energy consumption are discussed in detail in Section 3, *Air Quality*, and Section 8, *Greenhouse Gas Emissions*, respectively.

a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Construction Energy Demand

During project construction, energy would be consumed in the form of petroleum-based fuels used to power off-road construction vehicles and equipment on the project site, and construction worker

travel to and from the project site. Total consumption of gasoline and diesel fuel during project construction was estimated using the assumptions and factors from RCEM used to estimate construction air emissions for Section 3, *Air Quality,* and Section 8, *Greenhouse Gas Emissions* (Appendix A). Table 2 presents estimated energy consumption during project construction. As shown therein, construction equipment, water truck trips, and haul trips would consume approximately 11,590 gallons of diesel fuel, and construction worker trips would consume approximately 1,315 gallons of gasoline.

Table 2 Project Construction Energy Usage

Source	Fuel Consumption (gallons)
Construction Equipment & Water Truck/Haul Trips	11,590
Construction Worker Vehicle Trips	1,315

See Appendix D for energy consumption calculations.

Energy use during construction would be temporary in nature, and construction equipment used would be typical of similar-sized construction projects in the region. In addition, construction contractors would be required to comply with the provisions of California Code of Regulations Title 13 Sections 2449 and 2485, which prohibit off-road diesel vehicles and diesel-fueled commercial motor vehicles, respectively, from idling for more than five minutes and would minimize unnecessary fuel consumption. Construction equipment would be subject to the United States Environmental Protection Agency Construction Equipment Fuel Efficiency Standard, and water and haul trucks would be subject to the CARB Advanced Clean Trucks regulation, both of which would also minimize inefficient, wasteful, or unnecessary fuel consumption. These regulations would result in the efficient use of energy necessary to construct the project. Furthermore, in the interest of cost-efficiency, construction contractors would not utilize fuel in a manner that is wasteful or unnecessary. Therefore, project construction would not result in potentially significant environmental effects due to the wasteful, inefficient, or unnecessary consumption of energy, and no impact would occur.

Operational Energy Demand

As discussed in Section 3, *Air Quality*, the project would not require new operations and maintenance activities within the PVCWD service area upon completion of construction activities. Therefore, no new operational emissions would be generated, and project operation would not result in potentially significant environmental effects due to the wasteful, inefficient, or unnecessary consumption of energy. No impact could occur.

NO IMPACT

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

PVCWD does not have any specific renewable energy or energy efficiency plans with which the project could comply. In addition, no state plans for renewable energy or energy efficiency would apply to the project. Therefore, no impact would occur.

NO IMPACT

7 Geology and Soils

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1. 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?	☐	☐	■	☐
2. Strong seismic ground shaking?	☐	☐	■	☐
3. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
4. Landslides?	☐	☐	☐	■
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	■	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	■
e. Have soils incapable of adequately supporting the use of septic tanks or alternative 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?	☐	■	☐	☐

a.1. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving 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?

a.2. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

Like all of Southern California, the project site is subject to strong ground shaking associated with active and/or potentially active faults in the region. The project site is not located along a currently active mapped fault or within an Alquist-Priolo Fault Zone (DOC 2022a). While the project may be subject to strong ground shaking in the event of an earthquake, it would not be subject to unusual levels of ground shaking as compared to the rest of the region. Although the project site is located in a seismically active area, the project would not expose people to seismically-induced risk. The proposed project involves installation of an underground pipeline and would not involve any habitable structures. Design and construction of the proposed project would conform to the current seismic design provisions of the California Building Code (CBC) (CCR Title 24). While the project would be susceptible to seismic activity given its location within a seismically active area, the project would be required to minimize this risk, to the extent feasible, through the incorporation of applicable CBC standards. A large seismic event, such as a fault rupture, seismic shaking, or ground failure, could result in breakage of the proposed pipeline, failure of joints, and/or underground leakage from the pipeline. In the event an earthquake compromises the pipeline during operation, PVCWD would temporarily shut-off water conveyance processes and conduct emergency repairs as soon as practicable. Compliance with such requirements would reduce seismic ground shaking impacts to the maximum extent practicable with current engineering practices. Therefore, the project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault or strong seismic ground shaking. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.3. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

Liquefaction is the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. This means a liquefied soil acts more like a fluid than a solid when shaken during an earthquake. The project site is located in a liquefaction zone (DOC 2022b). Soils therefore have the potential to liquefy during a seismic event, and seismically-induced liquefaction could potentially damage the proposed pipeline in the event of an earthquake, resulting in joint failure or leakage from the pipeline. As discussed under thresholds (a.1) and (a.2), the project would be constructed in accordance with the current seismic design provisions of the CBC. In the event seismically-induced liquefaction compromises the pipeline during operation, PVCWD would temporarily shut-off water conveyance processes and conduct emergency repairs as soon as practicable. In addition, the project involves construction of water infrastructure and would not involve placement of habitable structures within a liquefaction-prone area, thereby minimizing the potential to result in loss, injury, or death involving seismic-related ground failure due to liquefaction. As a result, with adherence to existing regulatory requirements, the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.4. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

The project site is located in a relatively flat area that is not within or near an earthquake-induced landslide hazard zone (DOC 2022a). Therefore, the project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. No impact would occur.

NO IMPACT

b. Would the project result in substantial soil erosion or the loss of topsoil?

Soil erosion or the loss of topsoil may occur when soils are disturbed but not secured or restored, such that wind or rain events may mobilize disturbed soils, resulting in their transport off the project site. The project site is relatively flat; however, construction of the proposed pipeline would require grading and trenching on land that is currently undeveloped, which would involve exposing soil such that erosion and topsoil loss could occur.

Because the project disturbance area would be greater than one acre in size, the project would be subject to compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). The Construction General Permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP) to reduce erosion and topsoil loss from stormwater runoff during construction activities. Compliance with the requirements set forth in this permit would require the project contractor(s) to implement best management practices (BMPs) for erosion control during construction, such as preventing runoff from unprotected slopes, keeping disturbed areas to a minimum, and installing check berms and desilting basins during construction activities, as necessary. With adherence to the requirements of the Construction General Permit, the project would not result in substantial soil erosion or loss of topsoil, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project 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?

The proposed project would not be located in a seismically active area or in an earthquake-induced landslide hazard zone and therefore would have no potential to result in on- or off-site landslides. The project would also not include activities with the potential to result in subsidence, such as oil or groundwater extraction, or with the potential to result in lateral spreading and liquefaction, such as shallow groundwater injection. However, the project site is located in a liquefaction zone (DOC 2022b). As discussed above under threshold (a.3), the project would be constructed in accordance with the current seismic design provisions of the CBC to reduce the potential for the project to result in unstable geologic or soil conditions to the maximum extent practicable with current engineering practices. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project 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?

The project site contains soils composed of Camarillo sandy loam (14 percent clay), Camarillo loam (18.5 percent clay), Camarillo loam, sandy substratum (18.5 percent), Hueneme sandy loam (12.5 percent clay), and Riverwash (0.5 percent clay) (United States Department of Agriculture 2022). Due to the lack of clay content of the on-site soils, the potential for expansive soils to occur is low. In addition, the project does not include construction of habitable structures and would be unmanned during operation. Therefore, the proposed project would not expose people to risks related to expansive soils. As a result, the project would not create substantial direct or indirect risks to life or property as a result of expansive soils. No impact would occur.

NO IMPACT

e. Would the project 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?

The proposed project involves installation of a water pipeline that would serve as an interconnection between two existing PVCWD transmission lines. The project does not involve the use of septic tanks or alternative wastewater disposal systems. As a result, no impact would occur.

NO IMPACT

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., trackways, imprints, burrows, etc.). Paleontological resources are not found in “soil” but are contained within the geologic deposits or bedrock that underlie the soil layer. Generally, fossils are greater than 5,000 years old (i.e., older than middle Holocene in age) and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (Society of Vertebrate Paleontology [SVP] 2010). Fossils occur in a non-continuous and often unpredictable distribution within some sedimentary units, and the potential for fossils to occur within sedimentary units depends on several factors.

The geology of the region is mapped at a scale of 1:24,000 by Tan et al. (2004), who identified three geologic units underlying the project site, which are shown in Figure 6 - Quaternary wash deposits (Unit 2), Quaternary alluvial deposits (Unit 3), and Quaternary alluvial fan deposits. Rincon evaluated the paleontological sensitivity of the geologic units that underlie the project site to assess the project’s potential to result in significant impacts to scientifically important paleontological resources. The analysis was based on the results of a paleontological locality search from the Natural History Museum of Los Angeles County (NHMLA) and a review of existing information in the scientific literature regarding known fossils within geologic units mapped at the project site. According to the SVP (2010) classification system, geologic units can be assigned a high, low, undetermined, or no potential for containing scientifically significant paleontological resources. Following the literature review, a paleontological sensitivity classification was assigned to each geologic unit mapped within the project site. The classification is based on knowledge of rock units within which vertebrate or significant invertebrate fossils have been determined by previous studies

to be present or likely to be present. The potential for impacts to significant paleontological resources is based on the potential for ground disturbance to directly impact paleontologically sensitive geologic units.

Quaternary wash deposits (Unit 2) underlie the western portion of the project site (Figure 6). Quaternary wash deposits consist of unconsolidated silt, sand, and gravel and are Holocene in age (Tan et al. 2004). Tan et al. (2004) assigned Holocene alluvial and wash deposits into three units based on which drainage they were associated with. Unit 2 deposits are associated with Revolon Slough. Quaternary wash deposits (Unit 2) are likely too young (i.e., less than 5,000 years old) to preserve paleontological resources and, therefore, have **low paleontological sensitivity**.

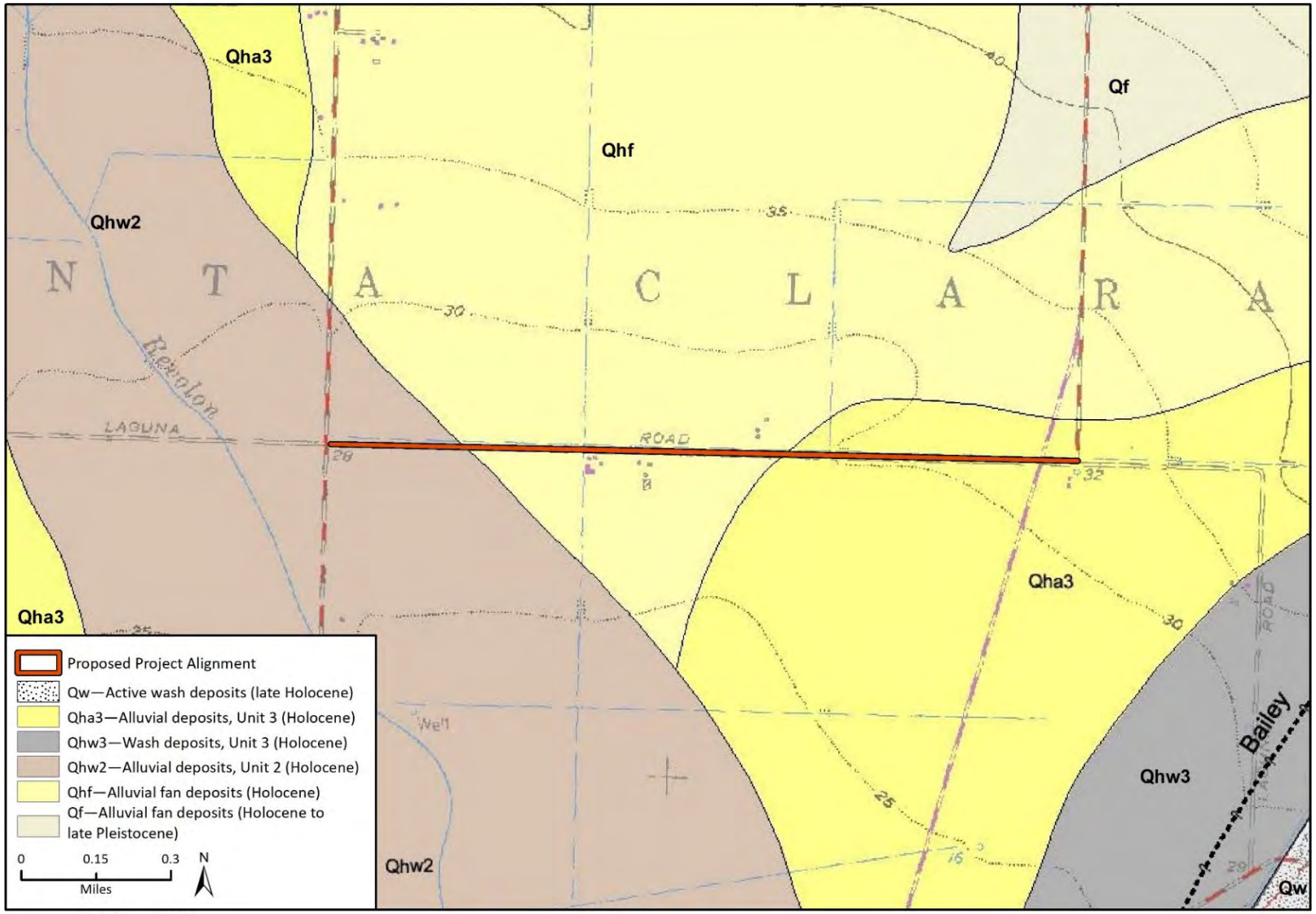
Quaternary alluvial deposits (Unit 3) underlie the eastern portion of the project site (Figure 6). Quaternary alluvial deposits consist of unconsolidated, poorly sorted, clayey sand with minor amounts of gravel containing scour and incised channel features that are Holocene in age (Tan et al. 2004). Tan et al. (2004) assigned Holocene alluvial and wash deposits into three units based on which drainage they were associated with. Unit 3 deposits are associated with Calleguas Creek. Quaternary alluvial deposits (Unit 3) are likely too young (i.e., less than 5,000 years old) to preserve paleontological resources and, therefore, have **low paleontological sensitivity**.

Quaternary alluvial fan deposits underlie the central portion of the project site (Figure 6). Quaternary alluvial fan deposits consist of moderately to poorly sorted, moderately to poorly bedded, sandy clay with some silt and gravel (Tan et al. 2004). Quaternary alluvial fan deposits represent Holocene and/or active alluvial fans whose sediment is deposited as debris flows, mudflows, or braided streams. Quaternary alluvial fan deposits are likely too young (i.e., less than 5,000 years old) to preserve paleontological resources and, therefore, have **low paleontological sensitivity**.

A fossil locality search from the NHMLA recovered no fossil localities from within the project site (Bell 2022).

All three of the geologic units underlying the project site - Quaternary wash deposits (Unit 2), Quaternary alluvial deposits (Unit 3), and Quaternary alluvial fan deposits - have low paleontological sensitivity. These geologic units are too young (i.e., less than 5,000 years old) to preserve paleontological resources. However, at some depth below the surface, these sediments will become old enough to preserve such resources and may therefore be highly sensitive. The proposed project would require excavation to a maximum depth of approximately 6.5 feet below the surface. The project site is located within an active depositional basin approximately 0.7 mile northwest of the nearest exposed bedrock (not depicted in Figure 6) and approximately 0.3 mile south of potentially early Holocene-Pleistocene sediments (Qf in Figure 6). As a result, sediments that are old enough to preserve paleontological resources are unlikely to be impacted by this project. Nevertheless, there is always potential to unexpectedly encounter paleontological resources during ground-disturbing activities. As a result, in the event of an unanticipated discovery, project impacts to paleontological resources would be potentially significant, and implementation of Mitigation Measure GEO-1 would be required to reduce impacts to a less-than-significant level.

Figure 6 Geologic Map of the Project Site



Basemap provided by Tan et al. 2004.

Mitigation Measure

GEO-1 Unanticipated Discovery of Paleontological Resources

In the event a fossil is discovered during construction of the project, ground disturbance within 50 feet of the find shall be temporarily halted or delayed until the discovery is examined by a Qualified Professional Paleontologist. PVCWD shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. If the find is determined to be significant, PVCWD shall retain a Qualified Professional Paleontologist to direct all mitigation measures related to paleontological resources. The Qualified Professional Paleontologist shall design and carry out a data recovery plan consistent with the SVP (2010) standards.

Significance after Mitigation

Mitigation Measure GEO-1 would entail implementation of a paleontological WEAP prior to the start of construction and appropriate treatment procedures in the event of an unanticipated discovery of paleontological resources during ground-disturbing activities. Therefore, implementation of Mitigation Measure GEO-1 would reduce impacts to paleontological resources to a less-than-significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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8 Greenhouse Gas Emissions

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

Overview of Climate Change and Greenhouse Gases

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. Climate change is the result of numerous, cumulative sources of GHG emissions contributing to the "greenhouse effect," a natural occurrence which takes place in Earth's atmosphere to help regulate the temperature of the planet. The majority of radiation from the sun hits Earth's surface and warms it. The surface, in turn, radiates heat back towards the atmosphere in the form of infrared radiation. Gases and clouds in the atmosphere trap and prevent some of this heat from escaping into space and re-radiate it in all directions.

GHGs occur both naturally and as a result of human activities, such as fossil fuel burning, decomposition of landfill wastes, raising livestock, deforestation, and some agricultural practices. GHGs produced by human activities include carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Anthropogenic activities since the beginning of the industrial revolution (approximately 250 years ago) are adding to the natural greenhouse effect by increasing the concentration of GHGs in the atmosphere that trap heat. Since 1750, estimated concentrations of CO_2, methane, and nitrous oxide in the atmosphere have increased over by 36 percent, 148 percent, and 18 percent, respectively, primarily due to human activity (Forster et al. 2007). Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature. Potential climate change impacts in California may include loss of snowpack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (State of California 2018).

Regulatory Framework

In response to climate change, California implemented Assembly Bill (AB) 32, the "California Global Warming Solutions Act of 2006." AB 32 required the reduction of statewide GHG emissions to 1990 emissions levels (essentially a 15 percent reduction below 2005 emission levels) by 2020 and the adoption of rules and regulations to achieve the maximum technologically feasible and cost-

effective GHG emissions reductions. On September 8, 2016, the Governor signed Senate Bill 32 into law, extending AB 32 by requiring the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program and the Low Carbon Fuel Standard, and implementation of recently adopted policies and legislation, such as SB 1383 (aimed at reducing short-lived climate pollutants including methane, hydrofluorocarbon gases, and anthropogenic black carbon) and SB 100 (aimed at accelerating the Renewables Portfolio Standard Program). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends local governments adopt policies and locally-appropriate quantitative thresholds consistent with a statewide per capita goal of six metric tons (MT) of CO_2e by 2030 and two MT of CO_2e by 2050 (CARB 2017).

Significance Thresholds

Individual projects do not generate sufficient GHG emissions to influence climate change directly. However, physical changes caused by a project can contribute incrementally to significant cumulative effects, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means the incremental effects of an individual project are significant when viewed in conjunction with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines Section 15064[h][1]).

To evaluate whether a project may generate a quantity of GHG emissions with the potential to have a significant impact on the environment, local air districts developed a number of bright-line significance thresholds. Significance thresholds are numeric mass emissions thresholds that identify the level at which additional analysis of project GHG emissions is necessary. If project emissions are equal to or below the significance threshold, with or without mitigation, the project's GHG emissions would be less than significant. VCAPCD has not established quantitative significance thresholds for evaluating GHG emissions in CEQA analyses, but it recommends using the California Air Pollution Control Officers Association (2008) CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act white paper and other resources when developing GHG evaluations (VCAPCD 2006). The *CEQA and Climate Change* paper provides a common platform of information and tools to support local governments and was prepared as a resource, not as a guidance document. CEQA Guidelines Section 15064.4 expressly provides a "lead agency shall have discretion to determine, in the context of a particular project," whether to "[q]uantify greenhouse gas emissions resulting from a project" and/or "[r]ely on a qualitative analysis or performance based standards." Updates to CEQA Guidelines Section 15064.4 that took effect in December 2018 further state that a lead agency should "focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change" and that the analysis should "reasonably reflect evolving scientific knowledge and state regulatory schemes."

In light of the lack of a specific GHG threshold recommended or adopted by VCAPCD or the County of Ventura or a GHG emission reduction plan adopted by PVCWD, it is appropriate to refer to guidance from other agencies when discussing GHG emissions. The South Coast Air Quality

Management District (SCAQMD), which is located adjacent to VCAPCD's jurisdiction, has been evaluating GHG significance thresholds since April 2008. In December 2008, the SCAQMD adopted an interim 10,000 MT of CO_2e per year screening level threshold for stationary source/industrial projects for which the SCAQMD is the lead agency. The SCAQMD has continued to consider adoption of significance thresholds industrial and non-industrial projects. The most recent proposal issued in September 2010 uses a tiered approach to evaluate potential GHG impacts from various uses (SCAQMD 2010). Based on this approach, PVCWD has determined that the threshold of 3,000 MT of CO_2e per year for non-industrial projects is the best available method to evaluate the significance of project-related GHG emissions. [3]

Methodology

GHG emissions associated with project construction were estimated using RCEM version 9.0.0, with the assumptions described under Section 3, *Air Quality*. In addition, in light of the lack of specific guidance from VCAPCD regarding the amortization of construction emissions, GHG emissions from construction of the proposed project were amortized over a 30-year period in accordance with SCAQMD's recommendation (SCAQMD 2008).[4]

a. Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction

Construction of the proposed project would generate temporary GHG emissions primarily as a result of operation of construction equipment at the project site as well as from vehicles transporting construction workers to and from the project site and heavy trucks to transport demolished and new materials and soil import/export. This analysis considers the combined impact of GHG emissions from both construction and operation. Calculations of CO_2, methane, and nitrous oxide emissions are provided to identify the magnitude of potential project effects. As shown in Table 3, project construction would result in emissions of approximately 128 MT of CO_2e total, or 4 MT of CO_2e when amortized over a 30-year period pursuant to SCAQMD guidance. Therefore, the project would not exceed the threshold of 3,000 MT of CO_2e per year, and the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. Impacts would be less than significant.

Table 3 Estimated Construction GHG Emissions

Year	Project Emissions (MT of CO_2e per year)
Total	128.1
Total Amortized over 30 Years	4.3
SCAQMD-Recommended Threshold	3,000
Threshold Exceeded?	**No**

MT = metric tons; CO2e = carbon dioxide equivalent; SCAQMD = South Coast Air Quality Management District
See Appendix A for RCEM results.

[3] Because the project would neither directly nor indirectly generate new population, comparison to a per capita or per service population threshold is not appropriate.
[4] The lifetime of the proposed pipeline is expected to be a minimum of 50 years. Therefore, use of a 30-year amortization period provides a conservative estimate of project impacts.

Operation

The project would not require new operations and maintenance activities within the PVCWD service area upon completion of construction activities. Therefore, no new operational GHG emissions would be generated, either directly or indirectly, that would have a significant impact on the environment. No impact would occur.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

PVCWD does not have any specific GHG emission reduction plans, policies, or regulations with which the project could comply. Therefore, the project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and no impact would occur.

NO IMPACT

9 Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	■	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	■	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	☐	☐	☐	■
d. Be located on a site that is included on a list of hazardous material 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 in an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	■
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	■	☐	☐
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	■

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Project construction would involve the use of potentially hazardous materials such as vehicle fuels and fluids. These materials would be contained within vessels specifically engineered for safe storage and would not be transported, stored, or used in quantities that would pose a significant hazard to the public or construction workers themselves. In addition, any use of potentially hazardous materials during construction of the proposed project would be required to comply with all local, state, and federal regulations regarding the handling of hazardous materials, which would minimize the potential for the project to create a significant hazard to the public or the environment. Operation of the project would not include the use of hazardous materials. Therefore, the project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project 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?

The presence of hazardous materials during project construction activities, including but not limited to ground-disturbing activities such as trenching, could result in an accidental upset or release of hazardous materials if they are not properly stored and secured. Hazardous materials used during project construction would be disposed of off-site in accordance with all applicable laws and regulations, including but not limited to the CBC and California Fire Code, as well the regulations of the federal and state Occupational Safety and Health Administrations. Nonetheless, upset or accident conditions could result in the unanticipated spill or release of hazardous materials such as vehicle and equipment fuels during project construction, potentially introducing a hazard to the public and/or the environment, which could result in a potentially significant impact especially if materials are released into the adjacent east-west drainage ditch. Implementation of Mitigation Measure HAZ-1 would be required to provide an additional level of safety during project construction, thereby reducing the potential impact to the public and environment due to release of hazardous materials during upset or accident conditions to a less-than-significant level.

As discussed under item (a), operation and maintenance of the project would involve the conveyance of water and would not require the routine use, storage, or disposal of hazardous materials. No impacts related to the release of hazardous materials due to reasonably foreseeable upset or accident conditions during project operation would occur.

Mitigation Measure

HAZ-1 Hazardous Materials Management and Spill Control Plan

PVCWD shall require its construction contractor(s) to submit a Hazardous Materials Management and Spill Control Plan (HMMSCP), including a project-specific contingency plan for hazardous materials and waste operations to PVCWD for review and approval. The HMMSCP shall establish policies and procedures consistent with applicable codes and regulations, including, but not limited to, the California Building and Fire Codes, as well as regulations promulgated by the United States Department of Labor, United States Occupational Safety and Health Administration, and California Occupational Safety and Health Administration. The HMMSCP shall articulate hazardous materials

handling practices to prevent the accidental spill or release of hazardous materials during project construction.

Significance after Mitigation

Mitigation Measure HAZ-1 would require preparation and implementation of a HMMSCP with appropriate procedures to implement in the event of an accidental spill or release of hazardous materials during project construction. Therefore, implementation of Mitigation Measure HAZ-1 would reduce impacts from reasonably foreseeable upset and accident conditions involving the release of hazardous materials to a less-than-significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

The nearest school to the project site is Lemonwood Elementary School, located approximately 3.3 miles to the west. Therefore, the project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. No impact would occur.

NO IMPACT

d. Would the project be located on a site that is included on a list of hazardous material 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?

The following databases compiled pursuant to Government Code Section 65962.5 were checked for known hazardous materials contamination within and adjacent to the project site:

- EnviroStor Database, California Department of Toxic Substances Control (DTSC)
- GeoTracker Database, California State Water Resources Control Board (SWRCB)

According to the database search, there is one known hazardous material site located near the project site (DTSC 2022; SWRCB 2022). The Rio Farms site is a listed cleanup site located approximately 0.1 mile north of the intersection of Las Posas Road and Laguna Road and 0.1 mile north of the project alignment. The Clean Up Status is listed as "closed" as of 2011 (SWRCB 2022). Due to the cleanup site's closed status and distance from the project site, the proposed project would not create a significant hazard to the public or the environment due to this cleanup site. Therefore, no impact would occur.

NO IMPACT

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?

The project site is approximately 2.2 miles south of the Camarillo Airport and is within the Camarillo Airport's land use study area and but is not within the Airport's Traffic Pattern Zone (TPZ), Runway Protection Zones, Outer Safety Zone, or Height Restriction Zone. The project site is also not located within the noise level contours for the airport (Ventura County Airport Land Use Commission 2000).

Therefore, the project would not result in a safety hazard or excessive noise for people working at the project site due to proximity to an airport. No impact would occur

NO IMPACT

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The project site is within the planning area of the County of Ventura's Emergency Operations Plan (County of Ventura 2021). The proposed project involves installation of an underground pipeline and would not modify or block current emergency access routes or site ingress and egress. While implementation of the proposed project would increase traffic to and from the project site during construction, the project site is surrounded by major roadways, such as U.S. 101, which have sufficient capacity to provide access to and from the project site (see Section, 17 *Transportation*). Project construction would require a temporary single-lane closure along Laguna Road, which could slow traffic through the local area and thereby affect implementation of emergency response and emergency evacuation plans. Therefore, impacts would be potentially significant, and implementation of Mitigation Measure HAZ-2 would be required to reduce impacts to a less-than-significant level.

Mitigation Measure

HAZ-2 Traffic Control Plan

PVCWD shall require the project contractor(s) to prepare and implement a traffic control plan that specifies how traffic will be safely and efficiently redirected during lane closures. All work shall comply with the Work Area Traffic Control Handbook, which conforms to the standards and guidance of the California Manual on Uniform Traffic Control Devices. Traffic control measures for lane closures shall be included, and priority access shall be given to emergency vehicles. The traffic control plan shall also include requirements to notify local emergency response providers at least one week prior to the start of work when lane closures are required.

Significance after Mitigation

Mitigation Measure HAZ-2 would require the project contractor(s) to safely redirect traffic, utilize traffic control measures, and give emergency response providers advance notification and priority access such that the potential to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan would be minimized. Therefore, implementation of Mitigation Measure HAZ-2 would reduce impacts to a less-than-significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

As discussed in detail in Section 20, *Wildfire*, the project site is near state responsibility areas (SRAs) or lands classified as Very High Fire Hazard Severity Zones (VHFHSZ) (California Department of Forestry and Fire Protection [CAL FIRE] 2020). According to the CAL FIRE, the project site is located approximately 0.8 mile west of the nearest SRA and approximately 1.5 miles northwest of the nearest VHFHSZ (CAL FIRE 2020). However, the project site is surrounded by existing irrigated agricultural fields and agro-industrial development and is not located near any undeveloped

wildland areas. In addition, the project consists of an underground pipeline and would not include habitable structures. Therefore, the project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. No impact would occur.

NO IMPACT

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10 Hydrology and Water Quality

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

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Construction

As stormwater flows over a construction site, it can pick up sediment, debris, and chemicals, and transport them to receiving water bodies. Temporary site preparation and trenching activities associated with the project may result in soil erosion. Construction activities could also affect water quality in the event of an accidental fuel or hazardous materials leak or spill. Receiving water bodies in the vicinity of the project site include two unnamed agricultural ditches, one of which runs parallel to the project alignment in an east-west direction and one of which crosses perpendicular to the project alignment in a north-south direction.

As previously discussed in Section 7, *Geology and Soils*, construction activities would be required to comply with the NPDES Construction General Permit (Order No. 2009-2009-DWQ, as amended) because project construction would disturb more than one acre of land. The NPDES Construction General Permit requires preparation and implementation of a project-specific SWPPP, which requires operators to implement pollution prevention controls to minimize the discharge of pollutants from stormwater and spilled or leaked materials. Such controls include installation of silt fencing and sandbag barriers, covering of stockpiles, use of desilting basins, and post-construction revegetation and drainage requirements. In addition, pursuant to the NPDES Construction General Permit requirements, inspections would be conducted on the project site once every seven calendar days, or once every 14 calendar days and within 24 hours of a 0.25-inch storm event. Compliance with applicable regulatory requirements would minimize potential surface water quality impacts associated with sediment erosion during project construction. Mitigation Measure BIO-2, as outlined in Section 4, *Biological Resources*, would also further reduce the potential for sediment erosion to impact the two agricultural ditches through implementation of additional best management practices for protecting these resources.

There is potential for accidental leaks and spills of hazardous materials at the surface, which could result in potentially significant impacts to water quality if hazardous materials enter the unnamed agricultural ditches. Mitigation Measure HAZ-1, as described in Section 9, *Hazards and Hazardous Materials*, would reduce the potential for accidental leaks and spills of hazardous materials by requiring preparation and implementation of an HMMSCP. With implementation of Mitigation Measure HAZ-1, project construction would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality, and the impact would be reduced to a less-than-significant level.

Operation

The proposed project consists of an underground water pipeline that would not have the potential to release contaminants that would adversely affect water quality during operation. As such, project operation would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. No impact would occur.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The project site overlies the Pleasant Valley Groundwater Basin (California Department of Water Resources [DWR] 2006), which is designated as a high-priority groundwater basin under the Sustainable Groundwater Management Act. In December 2019, the Fox Canyon Groundwater Management Agency adopted its Draft Groundwater Sustainability Plan (GSP) for the Pleasant Valley Basin, which was approved by DWR in 2021 (Fox Canyon Groundwater Management Agency 2022).

The project consists of a water pipeline that would be installed underground along the shoulder of Laguna Road, and the project site would be restored to pre-project conditions after the completion of construction activities. The project does not include the addition of impervious surfaces, and the underground pipeline would not substantially alter the ability for groundwater to percolate through the subsurface. In addition, as discussed in Section 17, *Utilities and Service Systems*, the project would not facilitate increased groundwater pumping because water conveyed through the proposed pipeline would be supplied from existing water sources, specifically the City of Oxnard's Advanced Water Purification Facility and the Conejo Creek Diversion Structure. Accordingly, the proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. No impact would occur.

NO IMPACT

c.(i) Would the project 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 result in substantial erosion or siltation on- or off-site?

c.(ii) Would the project 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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

c.(iii) Would the project 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 that would 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?

c.(iv) Would the project 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 impede or redirect flood flows?

The project consists of installing a pipeline underground in the existing ROW of Laguna Road. The project does not propose alterations to the course of a stream or river. As described above under threshold (b), the project would not result in an increase of impervious surfaces. As a result, the project would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; 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 impede or redirect flood flows. No impact would occur.

NO IMPACT

d. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

According to the Federal Emergency Management Agency Flood Insurance Rate Maps, the project alignment is not located in a flood hazard zone (Federal Emergency Management Act 2017). The project site is not located near any large bodies of water subject to seiche. The Pacific Ocean is located approximately six miles to the east of the project site; therefore, the project site is not located in a tsunami zone. As a result, the project would not risk release of pollutants due to project inundation by seiche, tsunami, or mudflow. No impact would occur.

NO IMPACT

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The project is subject to the requirements of Fox Canyon Groundwater Management Agency's Pleasant Valley Basin GSP. As described above in threshold (b), the project would not affect the result in increased groundwater pumping or otherwise affect the groundwater basin. Therefore, the project would not conflict with or obstruct the Pleasant Valley GSP.

The project is subject to the requirements of the Los Angeles Regional Water Quality Control Board's Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Los Angeles Regional Water Quality Control Board 2014). As described under threshold (a), the project would be required to comply with the NPDES Construction General Permit to protect water quality. The NPDES Construction General Permit requires preparation and implementation of a project specific SWPPP, which requires operators to implement pollution prevention controls to minimize the discharge of pollutants from stormwater and spilled or leaked materials. Compliance with applicable regulatory requirements would minimize potential surface water quality impacts associated with sediment erosion during project construction. Mitigation Measure BIO-2, as outlined in Section 4, *Biological Resources*, would also further reduce the potential for sediment erosion to impact the two agricultural ditches through implementation of additional best management practices for protecting these resources. There is potential for accidental leaks and spills of hazardous materials at the surface, which could result in potentially significant impacts to water quality if hazardous materials enter the unnamed agricultural ditches. Mitigation Measure HAZ-1, as described in Section 9, *Hazards and Hazardous Materials*, would reduce the potential for accidental leaks and spills of hazardous materials by requiring preparation and implementation of an HMMSCP. With implementation of Mitigation Measure HAZ-1, the project would not conflict with or obstruct implementation of the Los Angeles Regional Water Quality Control Board's Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties. Impacts would be less than significant with mitigation.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

11 Land Use and Planning

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

a. Would the project physically divide an established community?

The proposed project would include installation of an underground pipeline. Construction would be temporary in nature and would preserve one lane of access on Laguna Road during construction activities. The project does not include any aboveground infrastructure, and the project site would be restored to existing conditions after construction is complete. Therefore, the project would not have the potential to physically divide an established community, no impact would occur.

NO IMPACT

b. Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The proposed project would be located in unincorporated Ventura County. The project alignment is located in the public ROW of an existing roadway and does not have a General Plan land use designation or zoning. Pursuant to California Government Code 53091, the building and zoning ordinances of a county or city do not apply to the location or construction of facilities for the production, storage, or transmission of water, wastewater, or electrical energy by a local agency. Therefore, the project is only evaluated for consistency with the Ventura County General Plan.

The proposed project would be consistent with Policy PFS-7.4 of the Ventura County General Plan, which requires placement of new utility service lines underground when feasible (County of Ventura 2020a). In addition, as indicated in Section 4, *Biological Resources*, no biological resources protected by local policies and ordinances are located on the project site. Furthermore, the project would result in minimal changes to existing conditions upon completion of construction activities given that the proposed pipeline would be installed underground and no changes to PVCWD operations and maintenance would occur. As such, the project has minimal potential to conflict with other land use plans, policies, or regulations related to environmental resources during operation. As a result, the proposed project would not 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. No impact would occur.

NO IMPACT

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12 Mineral Resources

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

a. Would the project 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. Would the project 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?

The project site is located in an area designated Mineral Resource Zone (MRZ)-1 (County of Ventura 2020b). MRZ-1 is defined as an area where adequate geologic information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. As such, the proposed project would not reduce or eliminate access to known mineral resources. In addition, the proposed project does not involve mining or oil extraction activities. Therefore, the project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state or 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. No impact would occur.

NO IMPACT

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13 Noise

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

Overview of Noise and Vibration

Noise

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (California Department of Transportation [Caltrans] 2013).

HUMAN PERCEPTION OF SOUND

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response. Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure 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; dividing the energy in half would result in a 3 dB decrease (Caltrans 2013).

Human perception of noise has no simple correlation with sound energy: the perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not "sound twice as loud" as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease (i.e., twice the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (half) as loud (10.5 times the sound energy) (Caltrans 2013).

SOUND PROPAGATION AND SHIELDING

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in the noise level as the distance from the source increases. The manner by which noise reduces with distance depends on factors such as the type of sources (e.g., point or line), the path the sound will travel, site conditions, and obstructions.

Sound levels are described as either a "sound power level" or a "sound pressure level," which are two distinct characteristics of sound. Both share the same unit of measurement, the dB. However, sound power (expressed as L_{pw}) is the energy converted into sound by the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers, such as an eardrum or microphone, which is the sound pressure level. Sound measurement instruments only measure sound pressure, and noise level limits are typically expressed as sound pressure levels.

Noise levels from a point source (e.g., construction, industrial machinery, air conditioning units) typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance. Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013). Noise levels may also be reduced by intervening structures; the amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels. Natural terrain features, such as hills and dense woods, and man-made features, such as buildings and walls, can significantly alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5-dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2011).

DESCRIPTORS

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 factors of project noise impact. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. The noise descriptors used for this study are the equivalent noise level (L_{eq}), and the community noise equivalent level (CNEL; may also be symbolized as L_{den}).

L_{eq} is one of the most frequently used noise metrics; it considers both duration and sound power level. The L_{eq} is defined as the single steady-state A-weighted sound level equal to the average sound energy over a time period. When no time period is specified, a 1-hour period is assumed. The L_{max} is the highest noise level within the sampling period, and the L_{min} is the lowest noise level within the measuring period. Normal conversational levels are in the 60 to 65-dBA L_{eq} range; ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (Federal Transit Administration [FTA] 2018).

Groundborne Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent buildings or structures and vibration energy

may propagate through the buildings or structures. The primary concern from vibration is that it can be intrusive and annoying to building occupants at vibration-sensitive land uses and may cause structural damage. Typically, ground-borne vibration generated by manmade activities attenuates rapidly as distance from the source of the vibration increases. Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared (RMS) vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used as it corresponds to the stresses that are experienced by buildings (Caltrans 2020).

High levels of groundborne vibration may cause damage to nearby building or structures; at lower levels, groundborne vibration may cause minor cosmetic (i.e., non-structural damage) such as cracks. These vibration levels are nearly exclusively associated with high impact activities such as blasting, pile-driving, vibratory compaction, demolition, drilling, or excavation. The American Association of State Highway and Transportation Officials has determined vibration levels with potential to damage nearby buildings and structures; these levels are identified in Table 4.

Table 4 Maximum Vibration Levels for Preventing Damage

Type of Situation	Limiting Velocity (in/sec PPV)
Historic sites or other critical locations	0.1
Residential buildings, plastered walls	0.2–0.3
Residential buildings in good repair with gypsum board walls	0.4–0.5
Engineered structures, without plaster	1.0–1.5

in/sec = inches per second; PPV = peak particle velocity

Source: Caltrans 2020

Numerous studies have been conducted to characterize the human response to vibration. The vibration annoyance potential criteria recommended for use by Caltrans, which are based on the general human response to different levels of groundborne vibration velocity levels, are described in Table 5.

Table 5 Vibration Annoyance Potential Criteria

	Vibration Level (in/sec PPV)	
Human Response	Transient Sources	Continuous/Frequent Intermittent Sources[1]
Severe	2.0	0.4
Strongly perceptible	0.9	0.10
Distinctly perceptible	0.25	0.04
Barely perceptible	0.04	0.01

in/sec = inches per second; PPV = peak particle velocity

[1] Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans 2020

Project Noise Setting

The primary existing noise sources in the vicinity of the project site include vehicular traffic on Laguna Road in addition to agro-industrial development immediately north of the project alignment. Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated

with those uses. The Ventura County Construction Noise Threshold Criteria and Control Plan defines noise-sensitive receivers as hospitals, nursing homes, single-family and multi-family dwellings, hotels, motels, schools, churches, and libraries (Advanced Engineering Acoustics 2005). The nearest noise-sensitive receiver is a single-family residence located approximately 100 feet south of the project alignment across Laguna Road.

a. Would the project result in 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?

Construction

Project construction activities would generate temporary noise along the project alignment, exposing sensitive receivers to increased noise levels. Project construction noise would be generated by heavy-duty diesel construction equipment used for site preparation, trenching, infrastructure installation, and paving/site restoration activities. Each phase of construction has a specific equipment mix and associated noise characteristics, depending on the equipment used during that phase. Construction noise would be short-term and temporary at any given location given construction activities would move along the alignment over the course of the six-month construction schedule.

PVCWD has not adopted thresholds for construction noise. The project would not be subject to discretionary approval by the County of Ventura; however, for the purpose of this analysis, the construction noise thresholds outlined in the County's Construction Noise Threshold Criteria and Control Plan are utilized to evaluate project construction noise impacts (Advanced Engineering Acoustics 2005). The noise threshold criteria (NTC) set forth by the County of Ventura are based on the duration of construction affecting noise-sensitive receivers. Although project construction would occur over the course of six months, such a duration would not be characteristic of the duration in which individual sensitive receivers are exposed to construction noise due to the linear nature of the project. Exposure to any one single receptor would not typically exceed four to seven days, and the average distance from construction equipment over this time period is assumed to be 250 feet. According to the County's Construction Noise Threshold Criteria and Control Plan (2005), the NTC for an exposure duration of four to seven days is 70 dBA L_{eq}, or the ambient L_{eq} plus 3 dBA, whichever is greater, as measured at the nearest sensitive receiver or 10 feet from the nearest noise-sensitive building. In lieu of conducting ambient noise level measurements at the project site, the NTC of 70 dBA L_{eq} is conservatively utilized for the purpose of this analysis. In addition, consistent with the County's Construction Noise Threshold Criteria and Control Plan (2005), the threshold for maximum construction noise levels is the NTC plus 20 dBA, which cannot be exceeded more than eight times per daytime hour.

Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (FHWA 2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, construction noise levels were estimated at noise-sensitive receivers near the project site. RCNM provides reference noise levels for standard construction equipment, with an attenuation rate of 6 dBA per doubling of distance for stationary equipment.

The nearest sensitive receiver to project construction activities would be the single-family residence located approximately 100 feet south of the project alignment across Laguna Road. Over the course of a typical construction day, construction equipment would be located as close as 100 feet to this

property but would typically be located at an average distance farther away due to the nature of construction and the linear nature of the project. For example, during a typical construction day, equipment may operate approximately 100 to 500 feet from the nearest sensitive receivers. Therefore, it is assumed, over the course of a typical construction day, construction equipment would operate at an average distance of 250 feet from the nearest sensitive receiver to the south.

Construction noise is typically loudest during activities that involve ground disturbance and move soil, such as grading/trenching. Based on information provided by the project engineer, a potential construction scenario for the project would include simultaneous operation of a dozer and a grader working during grading/trenching. At a distance of 250 feet, a dozer and a grader would generate a noise level of 68.7 dBA L_{eq}, which would not exceed the threshold of 70 dBA L_{eq} set forth in the County of Ventura Construction Noise Threshold Criteria and Control Plan (Advanced Engineering Acoustics 2005; RCNM calculations are included in Appendix D). Therefore, project construction would not generate a substantial temporary increase in ambient noise levels in the vicinity of the project, and impacts would be less than significant.

Operation

The project would not include any sources of operational noise. As such, project operation would not generate a substantial temporary increase in ambient noise levels in the vicinity of the project, and no impact would occur.

LESS THAN SIGNIFICANT IMPACT

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Construction

Project construction may require operation of vibratory equipment such as loaded trucks and bulldozers within 25 feet of the warehouses to the north of the project alignment and 100 feet of the residential buildings to the south of project site across Laguna Road. As shown in Table 6 and Table 7, respectively, construction vibration levels would not exceed 0.20 in/sec PPV at the nearest residence, the threshold at which damage can occur to residential buildings, or 1.0 in/sec PPV at the warehouses, the threshold at which damage can occur to engineered structures. In addition, construction vibration levels would not exceed 0.25 in/sec PPV, which is the threshold for human annoyance based on the level at which transient vibration sources are distinctly perceptible (see Table 5). Because the use of construction equipment would not exceed the threshold for structural damage or human annoyance, project construction would not generate excessive groundborne vibration or groundborne noise levels. Impacts would be less than significant.

Table 6 Vibration Levels at Nearest Residential Residence

Equipment	Estimated Vibration Level at Nearest Residence (in/sec PPV) (100 feet)
Large Bulldozer	0.019
Loaded Truck	0.017
Threshold For Structural Damage to Residential Buildings[1]	**0.20**
Threshold Exceeded?	No
Threshold For Human Annoyance[2]	**0.25**
Threshold Exceeded?	No

in/sec = inches per second; PPV = peak particle velocity
[1] See Table 4 for maximum vibration levels for preventing damage.
[2] Threshold based on vibration annoyance potential criteria recommended by Caltrans, which are based on the general human response to different levels of groundborne vibration velocity levels. See Table 5.
See Appendix E for vibration analysis worksheets.

Table 7 Vibration Levels at Nearest Warehouse

Equipment	Estimated Vibration Level at Nearest Warehouse (in/sec PPV) (25 feet)
Large Bulldozer	0.089
Loaded Truck	0.076
Threshold For Structural Damage to Engineered Structures[1]	**1.0**
Threshold Exceeded?	No

in/sec = inches per second; PPV = peak particle velocity
[1] See Table 4 for maximum vibration levels for preventing damage.
See Appendix E for vibration analysis worksheets.

Operation

The proposed project consists of an underground pipeline, and operation would not include activities with the potential to generate significant vibration during operation, such as manufacturing or heavy equipment. Therefore, project operation would not result in generation of excessive groundborne vibration or groundborne noise levels. No impact would occur.

LESS THAN SIGNIFICANT IMPACT

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The nearest airport to the project site is Camarillo Airport, located approximately 2.2 miles to the north. The project site is not located within Camarillo Airport's noise level contours (Ventura County Airport Land Use Commission 2000). Given the distance of the project site from the airport, the project would not expose people residing or working in the project area to excessive noise levels associated with airport operations. No impact would occur.

NO IMPACT

14 Population and Housing

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

a. Would the project 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. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The project would involve installation of a water pipeline in the public ROW of a roadway to facilitate increased water transfers between the two existing PVCWD transmission laterals along Wood Road and Las Posas Road. The project does not include housing or other infrastructure that would directly lead to population growth. Given the small-scale nature of project construction activities, it is likely that construction workers would be drawn from the existing, regional workforce and would not indirectly result in the relocation of people to Ventura County. In addition, no new PVCWD employees would be required to operate and maintain the project. Furthermore, the project would not indirectly induce population growth because it does not include new water supply sources for the PVCWD service area. Therefore, the project would not directly or indirectly induce substantial unplanned population growth. No existing people or housing are located on project site; as such, the project would also not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. Accordingly, no impacts related to population/housing would occur.

NO IMPACT

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15 Public Services

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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:				
	1 Fire protection?	☐	☐	☐	■
	2 Police protection?	☐	☐	☐	■
	3 Schools?	☐	☐	☐	■
	4 Parks?	☐	☐	☐	■
	5 Other public facilities?	☐	☐	☐	■

a.1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, or the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

A.2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities, or the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

A.3. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered schools, or the need for new or physically altered schools, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

a.4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered parks, or the need for new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

a.5. Would the project result in substantial adverse physical impacts associated with the provision of other new or physically altered public facilities, or the need for other new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

As described in Section 14, *Population and Housing*, the project does not include development of structures or infrastructure that would directly or indirectly increase the population in Ventura County. In addition, as an underground pipeline, the project would not include components that would place additional demands on fire or police protection services. Therefore, the project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services, fire protection, police protection, schools, parks, or other public facilities. No impact would occur.

NO IMPACT

16 Recreation

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

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

As described in Section 14, *Population and Housing*, the project does not include development of structures or infrastructure that would directly or indirectly increase the population in Ventura County. Therefore, the project would not increase the population served by local recreation facilities or otherwise result in increased demand for or degradation of those facilities. As such, the project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. The project also does not include recreational facilities or require the construction or expansion of recreational facilities. No impact related to recreation would occur.

NO IMPACT

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17 Transportation

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

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Regional and local plans and policies addressing the circulation system include the Ventura County General Plan Circulation, Transportation and Mobility Element; the SCAG 2020-2045 RTP/SCS; and Ventura County Transportation Commission Congestion Management Plan (County of Ventura 2009, 2020a; SCAG 2020). Access to the project site during construction would be provided by Laguna Road, which is a two-lane road. No transit stops, sidewalks, or bicycle lanes are located along the segment of Laguna Road adjacent to the project site. Construction traffic would be temporary and limited to the duration of the construction schedule (approximately six months). Construction activities would require a temporary one-lane closure along Laguna Road, and traffic control measures would be implemented during this closure, including flaggers at both ends, to minimize conflicts with the circulation system. After construction is complete, no changes to existing transportation patterns would occur because the pipeline would be located underground and no new operation and maintenance activities would be required for the project. The minimal level of traffic generated during project construction would not have the potential to conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

CEQA Guidelines Section 15064.3(b) identifies criteria for evaluating transportation impacts. Specifically, the guidelines state VMT exceeding an applicable threshold of significance may indicate a significant impact. According to Section 15064.3(b)(3) of the CEQA Guidelines, a lead agency may include a qualitative analysis of operational and construction traffic if existing models or methods are not available to estimate the VMT for the particular project being considered. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. PVCWD has not adopted VMT thresholds. In 2020, the County of Ventura released its draft VMT thresholds of significance but has not yet adopted these thresholds (County of Ventura 2020c). In addition, the Ventura County General Plan includes Policy CTM 4,1, which encourages a reduction in the number of VMT (County of Ventura 2020a).

A VMT calculation is typically conducted on a daily or annual basis, for long-range planning purposes. As discussed under item (a) above, traffic on local roadways would temporarily increase during project construction due to worker trips and the necessary transport of construction vehicles, equipment, and soil material to and from the project site. Increases in VMT from construction would be short-term, minimal, and temporary. In addition, the project would not require new operations and maintenance activities within the PVCWD service area upon completion of construction activities. Therefore, the project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b). No impact related to VMT would occur.

NO IMPACT

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?

The project would not involve the construction of new roads or reconfiguration of any roadways or intersections that could result in a substantial increase in traffic hazards. During project construction, construction staging, and worker parking would occur along the project alignment adjacent to Laguna Road. Construction activities would require a temporary one-lane closure along Laguna Road, and traffic control measures would be implemented during this closure, including flaggers at both ends, to minimize the creation of traffic hazards. Upon the completion of construction, the pipeline would be located underground and thus would not substantially increase traffic hazards. Therefore, the project would not substantially increase hazards due to a geometric design feature or incompatible use. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project result in inadequate emergency access?

Construction of the project would require a temporary single-lane closure along Laguna Road, which would have the potential to impede emergency response in the project area. Therefore, the project would potentially result in inadequate emergency access during construction activities, and impacts would be potentially significant. Implementation of Mitigation Measure HAZ-2 (outlined in Section 9, *Hazards and Hazardous Materials*) would minimize interference with emergency access during project construction activities through implementation of traffic control measures and advance notification of emergency response providers prior to construction activities. With implementation of Mitigation Measure HAZ-2, impacts related to emergency access during project construction would be reduced to a less-than-significant level.

Operation of the pipeline would not introduce new vehicle trips or include aboveground features that would impede emergency access. Therefore, project operation would not result in inadequate emergency access, and no impact would occur.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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18 Tribal Cultural Resources

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

On July 1, 2015, Assembly Bill 52 (AB 52) was enacted, expanding CEQA by defining a new resource category, "tribal cultural resources." AB 52 states, "a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (PRC Section 21084.2). It further states the lead agency shall establish measures to avoid impacts altering the significant characteristics of a tribal cultural resource, when feasible (PRC Section 21084.3).

PRC Sections 21074 (a)(1)(A-B) define tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and are:

1. Listed or eligible for listing in the CRHR or in a local register of historical resources as defined in PRC Section 5020.1(k); or
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). In applying

these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process for California tribes regarding those resources. The consultation process must be completed before a CEQA document can be certified or adopted. Under AB 52, lead agencies are required to "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those having requested notice of projects proposed in the jurisdiction of the lead agency.

On July 19, 2022, PVCWD distributed AB 52 consultation letters for the proposed project, including project information, a map, and PVCWD contact information, to nine Native American tribes. The AB 52 consultation letters were sent, via certified mail, to the following tribal governments:

- Barbareño/Ventureño Band of Mission Indians
- Chumash Council of Bakersfield
- Coastal Band of the Chumash Nation
- Gabrieleño/Tongva San Gabriel Band of Mission Indians
- Gabrieliño/Tongva Nation
- Gabrieliño-Tongva Tribe
- Northern Chumash Tribal Council
- San Luis Obispo County Chumash Council
- Santa Ynez Band of Chumash Indians

Under AB 52, Native American tribes have 30 days to respond and request further project information and formal consultation; however, none of the contacted tribes responded within 30 days of mailing of the letters. Accordingly, AB 52 consultation is complete for the project.

a. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074 that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?*

b. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074 that is 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?*

No tribal cultural resources listed or eligible for listing in the CRHR or in a local register of historical resources were identified within the project site. In addition, no tribal cultural resources were identified within or near the project site that have been determined by PVCWD (the lead agency) to be significant. Therefore, the project would not cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074 that is listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in PRC Section 5020.1(k) or that is a resource determined by PVCWD (the lead agency), in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). No impact would occur.

NO IMPACT

19 Utilities and Service Systems

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

a. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Water

The project itself consists of installation of a water pipeline that would facilitate water transfers within PVCWD's existing system. The environmental impacts of this infrastructure have been evaluated throughout this document, and no additional environmental impacts would occur. In

addition, water conveyed through the proposed pipeline would be supplied from existing water sources, specifically the City of Oxnard's Advanced Water Purification Facility and the Conejo Creek Diversion Structure. Therefore, the project would not result the construction or relocation of additional new or expanded water facilities. No impact would occur.

Wastewater

The project would not require permanent on-site personnel and does not include the installation of restroom facilities. Therefore, no wastewater would be generated, and the project would not result the construction or relocation of additional new or expanded wastewater facilities. No impact would occur.

Stormwater Drainage

The proposed pipeline would be located underground and would not introduce any new impervious surfaces. Therefore, no new or expanded stormwater drainage facilities would be required, and no impact would occur.

Electric Power

The project would not require connections to the electrical grid and would not result in a net increase of electricity of electricity consumption within the PVCWD service area. Therefore, no new or expanded electrical power facilities would be required, and no impact would occur.

Natural Gas

The project would not require connections to natural gas facilities and would not result in a net increase of natural gas within the PCVWD service area. Therefore, no new or expanded natural gas facilities would be required, and no impact would occur.

Telecommunications

The project would not require any connection to telecommunication facilities. Therefore, no new or expanded telecommunication facilities would be required, and no impact would occur.

NO IMPACT

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

The project itself consists of installation of a water pipeline that would facilitate water transfers within PVCWD's existing system. Small quantities of water would be required during construction for dust suppression, which would be potable or non-potable water provided by PVCWD. Water consumption associated with dust suppression would be temporary and minimal because only disturbed areas would need to be watered. Water conveyed through the proposed pipeline would be supplied from existing water sources, specifically the City of Oxnard's Advanced Water Purification Facility and the Conejo Creek Diversion Structure. The project would not increase water supply availability or result in increased water consumption. Therefore, impacts related to water supply would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The project consists of installation of an underground water pipeline and would not generate wastewater. Therefore, the project would not result in a determination by the wastewater treatment that it has adequate capacity to serve the project's projected demand. No impact would occur.

NO IMPACT

d. Would the project 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. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Construction activities may temporarily generate solid waste, including soil spoils or other construction waste, which would be disposed of in accordance with all applicable federal, state, and local statutes and regulations. While most soil is expected to be reused as backfill material within the project area, approximately 1,185 cubic yards of soils would be disposed of at a nearby landfill, such as the Simi Valley Landfill. This landfill had a remaining capacity of 82,954,873 cubic yards as of 2019 (California Department of Resources Recycling and Recovery2022). Due to the temporary nature of construction and minimal amount of construction waste anticipated to require disposal, the project would not generate quantities of solid waste that would account for a substantial percentage of the total daily regional permitted capacity available at Simi Valley Landfill. In addition, operation of the proposed pipeline would not generate solid waste. Therefore, the project would not 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.

The project would be required to comply with all applicable laws and regulations related to solid waste generation, collection, and disposal. The project would result in a short-term and temporary increase in solid waste generation during construction but would not substantially affect standard solid waste operations of any landfill accepting waste. Recycling and reuse activities during construction would comply with the California Integrated Waste Management Act of 1989 (AB 939). Once operational, the proposed pipeline would not generate solid waste. Therefore, the project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste. Impacts related to solid waste would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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20 Wildfire

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	■	☐	☐
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of 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 downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	■

According to the CAL FIRE, the project site is approximately 0.8 mile west of the nearest SRA and approximately 1.5 miles northwest of the nearest VHFHSZ (CAL FIRE 2020). Therefore, the project site is considered to be near an SRA and lands classified as a VHFHSZ for the purposes of this analysis.

a. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

The proposed project would not add residents or employees to the project site and does not include structures that would increase wildfire exposure or hazards. As discussed in Section 17, *Transportation*, project construction would require a temporary single-lane closure along Laguna Road, which would have the potential to impede emergency response in the project area. Therefore, impacts related to emergency response and emergency evacuation plans would be potentially significant, and implementation of Mitigation Measure HAZ-2 (outlined in Section 9,

Hazards and Hazardous Materials) would be required to reduce impacts to a less-than-significant level through providing advance notification to emergency response providers and granting priority access to emergency vehicles during construction.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project, 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?

The project site is surrounded by existing irrigated agricultural lands with no wildland vegetation in its vicinity. The proposed project involves installation of an underground pipeline that would not have the potential to exacerbate fire risk. In addition, the project does not include habitable structures and thus would not accommodate occupants. Therefore, the proposed project would not exacerbate fire risk and thereby expose occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. No impact would occur.

NO IMPACT

c. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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?

The proposed project would not require the installation or maintenance of any infrastructure, such as roads or fuel breaks, that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. No impact would occur.

NO IMPACT

d. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The proposed project involves installation of an underground pipeline in a relatively flat area that would not have the potential to exacerbate fire risk. The proposed project does not include construction of habitable structures. Upon the completion of construction activities, the project site would be restored to pre-project conditions. Therefore, the project would not expose people or structures to flooding or landslides as a result of post-fire runoff, slope instability, or drainage changes. No impact would occur.

NO IMPACT

21 Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Does the project:				
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 future projects)?	☐	☐	■	☐
c. Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	■	☐

a. Does the project 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?

As discussed in Section 4, *Biological Resources*, the project would not 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, or substantially reduce the number or restrict the range of a rare or endangered plant or animal. In addition, as discussed in Section 5, *Cultural Resources*, the project would not eliminate important examples of the major periods of California history or prehistory. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

As described in the discussion of environmental checklist Sections 1 through 20, with respect to all environmental issues, the proposed project would not result in significant and unmitigable impacts to the environment. All anticipated impacts associated with project construction and operation would be either less than significant or less than significant with mitigation incorporated. This is largely due to the fact project construction activities would be temporary and project operation would result in minimal changes to the environmental baseline condition.

Cumulatively considerable impacts could occur if the construction of other projects occurs at the same time as the proposed project and in the same vicinity, such that the effects of similar impacts of multiple projects combine to expose adjacent sensitive receptors to greater levels of impact than would occur under the proposed project. For example, if the construction of other projects in the area occurs at the same time as construction of the proposed project, potential impacts associated with noise and traffic to residents in the project area may be more substantial. There are no other planned or pending projects within the immediate vicinity of the project site that could combine with the project to result in cumulative construction-related impacts (County of Ventura 2022b).

The project would result in no change to existing operations and maintenance activities in the PVCWD service area and would not increase water supply availability. Therefore, the project would not contribute to cumulative impacts related to direct or indirect population growth, such as impacts to public services, recreation, and population and housing. Impacts related to cultural resources, geology and soils, hazards and hazardous materials, land use and planning, mineral resources, and tribal cultural resources are inherently restricted to the project site and would not contribute to cumulative impacts associated with existing and future development in Ventura County. In addition, air quality and GHG impacts are cumulative by nature, and as discussed in Section 3, *Air Quality*, and Section 8, *Greenhouse Gas Emissions*, the project would not generate air pollutant emissions in excess of VCAPCD thresholds or GHG emissions that would exceed the SCAQMD-recommended threshold. Therefore, the project would not contribute to the existing significant cumulative air quality impacts related to the Basin's nonattainment status for ozone and PM_{10}or the existing significant cumulative climate change impact. Furthermore, project impacts to resources such as aesthetics, agriculture and forestry resources, biological resources, hydrology and water quality, noise, transportation, and utilities and service systems would be minimal and would not have the potential to constitute a cumulatively considerable contribution to cumulative impacts that may occur due to existing and future development in the region. Therefore, the proposed project would not result in a cumulatively considerable contribution to a significant impact.

LESS THAN SIGNIFICANT IMPACT

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

In general, impacts to human beings are associated with such issues as air quality, hazards and hazardous materials, and noise impacts. As detailed under Section 3, *Air Quality*, Section 9, *Hazards and Hazardous Materials*, and Section 13, *Noise*, the proposed project would not result, either

directly or indirectly, in substantial adverse effects related to air quality, hazardous materials, and noise. Therefore, impacts to human beings would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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Appendix A

Air Quality and Greenhouse Gas Emissions Modeling

Road Construction Emissions Model **Version 9.0.0**

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	PVCWD Laguna Road HDPE Pipeline	
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	6.00	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)	1	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	1.52	miles
Total Project Area	1.10	acres
Maximum Area Disturbed/Day	0.11	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.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

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	16.00	0.00	
	Grading/Excavation	16.00	56.82	75.76
	Drainage/Utilities/Sub-Grade	16.00		
	Paving	16.00		
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	No 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	No 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.

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		0.60	7/1/2023	1/1/2023
Grading/Excavation		2.40	7/20/2023	1/20/2023
Drainage/Utilities/Sub-Grade		2.10	10/3/2023	4/3/2023
Paving		0.90	12/6/2023	6/6/2023
Totals (Months)		6		

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				0	0.00
Miles/round trip: Grading/Excavation	20.00			9	180.00
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00
Miles/round trip: Paving				0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Grading/Excavation (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Paving (grams/mile)	0.04	0.43	3.53	0.12	0.05	0.02	1,724.78	0.00	0.27	1,805.62
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	0.02	0.17	1.49	0.05	0.02	0.01	685.23	0.00	0.11	717.34
Tons per const. Period - Grading/Excavation	0.00	0.00	0.04	0.00	0.00	0.00	18.09	0.00	0.00	18.94
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	0.04	0.00	0.00	0.00	18.09	0.00	0.00	18.94

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				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00
Miles/round trip: Paving				0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Grading/Excavation (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Paving (grams/mile)	0.04	0.43	3.53	0.12	0.05	0.02	1,724.78	0.00	0.27	1,805.62
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	0.00	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	0.00	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	0.00	0.00	0.00	0.00

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 Daily Trips	Calculated Daily VMT
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing	6		12	240.00
No. of employees: Grading/Excavation	6		12	240.00
No. of employees: Drainage/Utilities/Sub-Grade	6		12	240.00
No. of employees: Paving	6		12	240.00

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	316.71	0.00	0.01	318.72
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	2.74	0.29	0.00	0.00	0.00	68.06	0.07	0.03	79.25
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.04	0.56	0.05	0.02	0.01	0.00	169.88	0.00	0.00	171.25
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	1.13
Pounds per day - Grading/Excavation	0.04	0.56	0.05	0.02	0.01	0.00	169.88	0.00	0.00	171.25
Tons per const. Period - Grading/Excavation	0.00	0.01	0.00	0.00	0.00	0.00	4.48	0.00	0.00	4.52
Pounds per day - Drainage/Utilities/Sub-Grade	0.04	0.56	0.05	0.02	0.01	0.00	169.88	0.00	0.00	171.25
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.00	0.00	0.00	0.00	3.92	0.00	0.00	3.96
Pounds per day - Paving	0.04	0.55	0.05	0.02	0.01	0.00	169.37	0.00	0.00	170.73
Tons per const. Period - Paving	0.00	0.01	0.00	0.00	0.00	0.00	1.68	0.00	0.00	1.69
Total tons per construction project	0.00	0.04	0.00	0.00	0.00	0.00	11.21	0.00	0.00	11.30

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			10.00		50.00
Grading/Excavation - Exhaust	1		5.00			10.00		50.00
Drainage/Utilities/Subgrade	1		5.00			10.00		50.00
Paving	1		5.00			10.00		50.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Grading/Excavation (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.43	3.54	0.12	0.05	0.02	1,726.74	0.00	0.27	1,807.67
Paving (grams/mile)	0.04	0.43	3.53	0.12	0.05	0.02	1,724.78	0.00	0.27	1,805.62
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	0.05	0.44	0.01	0.01	0.00	190.34	0.00	0.03	199.26
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	0.00	1.32
Pounds per day - Grading/Excavation	0.00	0.05	0.44	0.01	0.01	0.00	190.34	0.00	0.03	199.26
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	5.02	0.00	0.00	5.26
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.05	0.44	0.01	0.01	0.00	190.34	0.00	0.03	199.26
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.01	0.00	0.00	0.00	4.40	0.00	0.00	4.60
Pounds per day - Paving	0.00	0.05	0.44	0.01	0.01	0.00	190.12	0.00	0.03	199.04
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	1.88	0.00	0.00	1.97
Total tons per construction project	0.00	0.00	0.03	0.00	0.00	0.00	12.56	0.00	0.00	13.15

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	0.11		1.10	0.01	0.23	0.00
Fugitive Dust - Grading/Excavation	0.11		1.10	0.03	0.23	0.01
Fugitive Dust - Drainage/Utilities/Subgrade	0.11		1.10	0.03	0.23	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 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
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
			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
			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
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			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
1.00			Model Default Tier	Tractors/Loaders/Backhoes	0.15	2.23	1.54	0.08	0.07	0.00	301.58	0.10	0.00	304.82
			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
Grubbing/Land Clearing	pounds per day	0.34	5.49	3.08	0.15	0.14	0.01	801.68	0.26	0.01	810.32
Grubbing/Land Clearing	tons per phase	0.00	0.04	0.02	0.00	0.00	0.00	5.29	0.00	0.00	5.35

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
			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
1.00			Model Default Tier	Graders	0.38	1.69	4.65	0.15	0.14	0.01	640.86	0.21	0.01	647.76
			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 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 Equipn	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
1.00			Model Default Tier	Plate Compactors	0.04	0.21	0.25	0.01	0.01	0.00	34.48	0.00	0.00	34.65
			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
1.00			Model Default Tier	Rubber Tired Dozers	0.68	3.11	7.13	0.32	0.30	0.01	827.00	0.27	0.01	835.91
1.00			Model Default Tier	Rubber Tired Loaders	0.27	1.51	2.65	0.09	0.08	0.01	605.56	0.20	0.01	612.10
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			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
Grading/Excavation	pounds per day	1.38	6.52	14.69	0.57	0.53	0.02	2,107.90	0.67	0.02	2,130.42
Grading/Excavation	tons per phase	0.04	0.17	0.39	0.02	0.01	0.00	55.65	0.02	0.00	56.24

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
			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
			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
1.00			Model Default Tier	Plate Compactors	0.04	0.21	0.25	0.01	0.01	0.00	34.48	0.00	0.00	34.65
			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
1.00			Model Default Tier	Rollers	0.15	1.85	1.61	0.09	0.08	0.00	254.11	0.08	0.00	256.85
			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
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			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
	Drainage/Utilities/Sub-Grade	pounds per day	0.19	2.06	1.86	0.10	0.09	0.00	288.59	0.09	0.00	291.50
	Drainage/Utilities/Sub-Grade	tons per phase	0.00	0.05	0.04	0.00	0.00	0.00	6.67	0.00	0.00	6.73

Appendix B

Plant and Wildlife Species Observed in the Survey Area

Table 1 Plant Species Observed in the Biological Study Area

Scientific Name	Common Name	Special Status [1]	Native or Introduced[2]
Amaranthus blitoides	prostrate pigweed	-	Native
Araucaria sp.	bunya bunya	-	Introduced
Atriplex prostrata	fat hen	-	Introduced
Atriplex semibaccata	Australian saltbush	-	Invasive; Cal-IPC Moderate
Baccharis salicifolia	mulefat	-	Native
Bassia hyssopifolia	five horn bassia	-	Invasive; Cal-IPC Limited
Bromus catharticus	rescue grass	-	Introduced
Bromus madritensis ssp. *rubens*	red brome	-	Invasive; Cal-IPC High
Capsella bursa-pastoris	shepherd's purse	-	Introduced
Chenopodium album	labs quarters	-	Introduced
Convolvulus arvensis	field bindweed	-	Introduced
Cotoneaster sp.	cotoneaster	-	Introduced
Cressa truxillensis	alkali weed	-	Native
Cynodon dactylon	Bermuda grass	-	Invasive; Cal-IPC Moderate
Cyperus involucratus	umbrella plant	-	Introduced
Datura wrightii	Jimsonweed	-	Native
Erigeron bonariensis	flax-leaved horseweed	-	Introduced
Erigeron canadensis	Canada horseweed	-	Native
Erodium cicutarium	red stemmed filaree	-	Invasive; Cal-IPC Limited
Euphorbia serpens	matted sandmat	-	Introduced
Heliotropium curassavicum var. *oculatum*	alkali heliotrope	-	Native
Hirschfeldia incana	summer mustard	-	Invasive; Cal-IPC Moderate
Lactuca serriola	prickly lettuce	-	Introduced
Lepidium didymum	lesser swine cress	-	Introduced
Leptochloa fusca	sprangletop	-	Native
Malacothrix saxatilis	cliff aster	-	Native
Malva parviflora	cheeseweed	-	Introduced
Myoporum laetum	ngaio tree	-	Invasive; Cal-IPC Moderate
Nasturtium officinale	watercress	-	Native
Nicotiana glauca	tree tobacco	-	Invasive; Cal-IPC Moderate
Opuntia ficus-indica	prickly pear	-	Introduced
Persicaria sp.	smartweed	-	-
Phoenix canariensis	Canary Island date palm	-	Invasive; Cal-IPC Limited
Polypogon interruptus	ditch beard grass	-	Introduced
Polypogon monspeliensis	rabbitsfoot grass	-	Invasive; Cal-IPC Limited
Portulaca oleracea	common purslane	-	Introduced
Pseudognaphalium luteoalbum	Jersey cudweed	-	Introduced

Scientific Name	Common Name	Special Status [1]	Native or Introduced[2]
Quercus agrifolia	coast live oak	-	Native
Ricinus communis	castor bean	-	Invasive; Cal-IPC Limited
Rumex sp.	dock	-	-
Schinus molle	Peruvian pepper tree	-	Invasive; Cal-IPC Limited
Schinus terebinthifolius	Brazilian pepper tree	-	Invasive; Cal-IPC Limited
Solanum elaeagnifolium	horse nettle	-	Introduced
Sonchus oleraceus	common sow thistle	-	Introduced
Stipa miliacea var. *miliacea*	smilo grass	-	Invasive; Cal-IPC Limited
Syagrus romanzoffiana	queen palm	-	Introduced
Tribulus terrestris	puncture vine	-	Invasive; Cal-IPC Limited
Typha domingensis	narrowleaf cattail	-	Native
Ulmus parvifolia	Siberian elm	-	Introduced
Washingtonia robusta	Mexican fan palm	-	Invasive; Cal-IPC Moderate

Cal-IPC = California Invasive Plant Council

[1] Special Status includes the status of species identified as federally, state, and/or locally sensitive.

[2] Jepson Flora Project 2022, Cal-IPC 2022

Table 2 Wildlife Species Observed in the Biological Study Area

Scientific Name	Common Name	Special Status[1]	Native or Introduced
Ardea alba	great egret	-	Native
Ardea herodias	great blue heron	-	Native
Eremophila alpestris actia	California horned lark	WL	Native
Euphagus cyanocephalus	Brewer's blackbird	-	Native
Haemorhous mexicanus	house finch	-	Native
Hirundo rustica	barn swallow	-	Native
Passer domesticus[2]	house sparrow[2]	-	Introduced
Sayornis nigricans	black phoebe	-	Native
Zenaida macroura	mourning dove	–	Native

WL = CDFW Watch List

[1] Special Status includes the status of species identified as federally, state, and/or locally sensitive.

[2] Active nest observed in building eaves. See Figure 5 in *Draft Initial Study-Mitigated Negative Declaration for the Recycled Water Connection Project* for location.

Appendix C

Cultural Resources Letter Report (redacted)

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

805 644 4455

info@rinconconsultants.com
www.rinconconsultants.com

October 19, 2022
Project No: 22-12605

Adam Bugielski, PE, Project Manager
Michael K. Nunley and Associates, Inc.
121 North Fir Street, Unit G
Ventura, California 93001
Via email: abugielski@mknassociates.us

Subject: Cultural Resources Letter Report for the Pleasant Valley County Water District's Groundwater Sustainability Improvement Program, Unincorporated Ventura County, California

Dear Mr. Bugielski:

This letter report presents the findings of a cultural resources study completed in support of the Pleasant Valley County Water District's (PVCWD) Groundwater Sustainability Improvement Program-Pipeline Connection Project (project) located in unincorporated Ventura County, California. Michael K. Nunley and Associates, Inc. (MKN) retained Rincon Consultants, Inc. (Rincon) to support the proposed project's compliance with the California Environmental Quality Act (CEQA). An Initial Study-Mitigated Negative Declaration is also being prepared for the project. This letter report documents the results of the tasks performed by Rincon, specifically a cultural resources records search, archival and background research, a Sacred Lands File (SLF) search conducted by the Native American Heritage Commission (NAHC), and a pedestrian field survey. All work was completed in accordance with CEQA for which PVCWD is the lead agency.

Project Location and Description

The project site is located along the northern shoulder of Laguna Road, from Wood Road to approximately 350 feet east of the intersection of Laguna Road and Las Posas Road, south of the city of Camarillo and east of the city of Oxnard, in unincorporated Ventura County, California (Attachment 1: Figure 1). Specifically, the project encompasses portions of Sections 9, 15 and 16 of Township 1 North, Range 21 West on the *Camarillo, California* United States Geological Survey (USGS) 7.5-minute topographic quadrangle (Attachment 1: Figure 2). The project site is bound by agricultural fields and agro-industrial development to the north, south, west, and east.

The project includes the construction of approximately 9,000 linear feet (LF) of new 18-inch non-potable water pipeline that would connect two existing transmission pipelines located along Wood Road and Las Posas Road. The purpose of the project is to facilitate increased transfer of existing water supplies available to the PVCWD service area, specifically water supplied by the City of Oxnard's Advanced Water Purification Facility and the Conejo Creek Diversion Structure. The project would not enable the use of new water supply sources in the PVCWD service area. Open trenching would be used to install the majority of the pipeline; however, trenchless methods would be used to install the portion of the pipeline that crosses the Las Posas Road Drain and may also be used to cross Las Posas Road to

minimum traffic impacts, both of which cross perpendicular to the alignment. The maximum depth of excavation would be approximately 6.5 feet.

Methods

Background and Archival Research

Rincon completed background and archival research in support of this assessment in June 2022. A variety of primary and secondary source materials were consulted. Sources included historical maps and aerial photographs. The following sources were utilized to develop an understanding of the project site and its context:

- GoogleEarth imagery
- Historical aerial photographs accessed via NETR Online
- Historical aerial photographs accessed via University of California, Santa Barbara Library FrameFinder
- Historical USGS topographic maps

California Historical Resources Information System Records Search

On May 18, 2022, Rincon received California Historical Resources Information System (CHRIS) records search results (Records Search File Number: 23676.9777) from the South Central Coastal Information Center (SCCIC) located at California State University, Fullerton (Attachment 2). The SCCIC is the official state repository for cultural resources records and reports for Ventura County. The purpose of the records search was to identify previously recorded cultural resources, as well as previously conducted cultural resources studies within the project site and a 0.5-mile radius surrounding it. Rincon also reviewed the National Register of Historic Places, the California Register of Historical Resources (CRHR), the California Historical Landmarks list, and the Built Environment Resources Directory as well as its predecessor the California State Historic Property Data File.

Sacred Lands File Search

Rincon contacted the NAHC on April 18, 2022, to request a search of the SLF as well as an Assembly Bill (AB) 52-specific contact list of Native Americans culturally affiliated with the project site vicinity (Attachment 3).

Field Survey

Rincon archaeologist Mary Pfeiffer, BA, conducted a pedestrian survey of the project site on July 1, 2022, using transect intervals spaced five meters apart and oriented generally from east to west. Exposed ground surfaces were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools), ecofacts (marine shell and bone), soil discoloration that might indicate the presence of a cultural midden, and features indicative of the former presence of structures or buildings (e.g., standing exterior walls, postholes, foundations) or historic debris (e.g., metal, glass, ceramics). Ground disturbances such as drainages were also visually inspected. Survey accuracy was maintained using a handheld Global Positioning Satellite unit and a georeferenced map of the project site. Site

characteristics and survey conditions were documented using field records and a digital camera. Copies of the survey notes and digital photographs are maintained at the Rincon Ventura office.

Findings

The following sections summarize the results of all background research and fieldwork as they pertain to archaeological resources that may qualify as historical resources and/or unique archaeological resources.

Known Cultural Resources Studies

The CHRIS records search and background research identified seven cultural resources studies within a 0.5-mile radius of the project site (Attachment 2). Of these studies, four (VN-01341, VN-01403, VN-02978 and VN-03109) include a portion of the project site and two (VN-00491 and VN-01410) are located within 900 feet of the project site. Although the entire project site appears to have been studied previously, only approximately 20 percent of the project site has been previously surveyed. Known studies that covered a portion of the project site are discussed in further detail below.

VN-01341

Study VN-01341, *The Results of a Phase 1 Archaeological Study for Approximately 37 Acres, Located on the Southwest Corner of Los Posas Road and Laguna Road, City of Camarillo, County of Ventura, California,* was prepared by Robert J. Wlodarski in 1995. The study included archival research, a cultural resources records search, an archaeological pedestrian field survey and provided management recommendations. The pedestrian survey covered approximately 1,200 feet (approximately 15 percent) of the current project site. No archaeological resources were identified within the current project site as a result of the study.

VN-01403

Study VN-01403, *Phase I Archaeological Survey of the Proposed Hill Canyon 9.2 Mile Pipeline Corridor, Ventura County, California*, was prepared by W and S Consultants in 1994. The study included archival research, a cultural resources records search, an archaeological pedestrian field survey and provided management recommendations. The pedestrian survey covered approximately 300 feet (approximately four percent of the current project site). One previously unidentified archaeological site (CA-VEN-1152) was identified during the survey; however, it is located approximately [CONFIDENTIAL: REDACTED] from the current project site.

VN-02978

Study VN-02978, *Groundwater Recovery Enhancement and Treatment (GREAT) Program Cultural Resources Inventory Report*, was prepared by CH2M Hill in 2004. The study encompasses all of western Ventura County and included archival research, a cultural resources records search, a Sacred Lands File search performed by the NAHC, Native American outreach, an archaeological pedestrian field survey and provided management recommendations. This study did not survey the current project site. One previously unidentified historic-period isolate and six historic-period buildings were identified during the field survey; however, all of the resources are located outside of the current project site.

VN-03109

Study VN-03109, *Archaeological Survey Report for Southern California Edison Company's Houweling Nursery Interconnection Project (IO 321669), New 16 kV Gen-Tie Line, Near Camarillo, Ventura County, CA*, was prepared by James J. Schmidt in 2012. The study included archival research, a cultural resources records search, an archaeological pedestrian field survey and provided management recommendations. The pedestrian survey covered approximately one percent of the current project area. No cultural resources were identified within the current project site as a result of the study.

Known Cultural Resources

The CHRIS records search and background research identified no previously recorded cultural resources within the project site or a 0.5-mile radius surrounding it.

Historical Topographic Maps and Aerial Imagery Review

Rincon completed a review of historical topographic maps and aerial imagery to ascertain the development history of the project site. A historical topographic map from 1904 shows Laguna Road and Wood Road in their current alignment, as well as adjacent building development on the north and south sides of Laguna Road (USGS 2022a). Available aerial imagery from 1932 to present-day shows the project site encompassed by agricultural fields (NETR 2022; GoogleEarth 2022; UCSB Map and Imagery Lab 1932). The two buildings depicted on the topographic map from 1904 remain unchanged until 1943 (USGS 2022a and 2022b). By 1950, two additional structures were erected adjacent to the building located on the south side of Laguna Road. That same year, the building on the north side of Laguna Road had been demolished with four smaller structures constructed within the same footprint (USGS 2022c). Maps and aerial imagery from 1967 show the construction of Las Posas Road in its current alignment, with continued building development on the south and north sides of Laguna Road through 1980 (NETR 2022; USGS 2022d). The project site and immediate vicinity do not experience any changes in building development or agricultural use as shown on aerial imagery from 1980 to 1994. A feature that appears to be an irrigation channel depicted on a 1982 topographic map begins at the intersection of Las Posas Road and Laguna Road and continues along the north side of Laguna Road for approximately one mile (NETR 2022; USGS 2022e). By 2002, an agro-industrial development was constructed on the north side of Laguna Road and remains unchanged (NETR 2022).

Sacred Land File Search

On May 17, 2022, the NAHC responded to Rincon's AB 52 contacts and SLF request, stating the results of the SLF search were negative. See Attachment 3 for the NAHC response, including Tribal contacts list(s). AB 52 consultation was conducted between PVCWD and California Native American tribes who have requested notification of projects in their traditional area. No Tribes responded requesting consultation.

Survey Results

During the archaeological pedestrian survey, ground visibility was excellent (approximately 90 percent) with 100 percent overhead exposure. Modern refuse in the form of tires, lumber, plastic, paper and glass lined the northern shoulder of Laguna Road (Figure 3 and Figure 4). Soil is a compacted light brown very fine-grained silty sand with a sparse imported gravel overlay (Figure 5). Blue patches of soil, likely the result of adjacent agricultural activity and spraying, were observed were observed from the

intersection of Laguna Road and Las Posas Road, terminating at the agro-industrial nursery building (Figure 6). Surrounding vegetation consisted of seasonal grasses and mature crops. The project site has been extensively disturbed from the installation of underground water, gas, and telecommunications utilities as well as adjacent roadway construction and maintenance (Figure 7, Figure 8, and Figure 9). A low-density, dispersed scatter of approximately 60 highly-fragmented marine clam shells that were weathered and sun-bleached was identified [CONFIDENTIAL: REDACTED DUE TO THE CONFIDENTIALITY OF POTENTIAL CULTURAL MATERIAL LOCATIONS] (Figure 10, Figure 11, and Figure 12). No prehistoric cultural materials such as flaked stone or animal bone were observed in association with the shell. A v-ditch approximately 10 feet in depth is located adjacent to the project alignment and allowed for examination of the stratigraphic soil profile (Figure 13 and Figure 14). No changes in soil or cultural materials were observed in the wall of the v-ditch; however, the possibility of subsurface deposits associated with the clam shells remain.

A second shell scatter consisting of seven mussel shell fragments, concentrated in a small, five-foot by five-foot area, was identified [CONFIDENTIAL: REDACTED DUE TO THE CONFIDENTIALITY OF POTENTIAL CULTURAL MATERIAL LOCATIONS] of the clam shell scatter (Figure 15 and Figure 16). The mussel shells were not weathered or sun bleached and appeared to be discarded and broken in place. On August 25, 2022, PVCWD's General Manager Jared Bouchard provided additional information regarding the origin of the mussel shells via email. Mr. Bouchard stated the adjacent v-ditch is part of an extensive tile drain and agricultural tail waters collection system and when the ditch is cleared, debris is deposited and subsequently spread over the area. It is common for mussels to be in the PVCWD-supplied water because they grow inside the piping and are discharged through agricultural operations and can be found in the tail water that ends up in the ditch system. Given the lack of associated artifacts, context of the finds, and information provided by PVCWD, the mussel shell fragments are considered modern and are not considered a cultural resource.

Conclusions and Recommendations

The impact analysis included here is organized based on the cultural resources thresholds included in CEQA Guidelines Appendix G: Environmental Checklist Form:

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?
b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?
c. Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Threshold (a) broadly refers to historical resources. To more clearly differentiate between archaeological and built environment resources, the analysis under Threshold A is limited to built environment resources. Archaeological resources, including those that may be considered historical resources pursuant to CEQA Guidelines Section 15064.5 and those that may be considered unique archaeological resources pursuant to Public Resources Code Section 21083.2, are considered under Threshold (b).

Historical Built Environment Resources

The records search, background research, and field survey did not identify any historical built environment resources within the project site. Therefore, the project would not result in a substantial adverse change to the significance of a historical resource. As such, implementation of the project would result in ***no impact to historical resources*** pursuant to CEQA.

Historical and Unique Archaeological Resources

This cultural resources study identified a low-density marine clam shell scatter [CONFIDENTIAL: REDACTED DUE TO THE CONFIDENTIALITY OF POTENTIAL CULTURAL MATERIAL LOCATIONS] during the pedestrian field survey. The origin of the marine clam shell is unknown. The project site has been previously disturbed from roadway construction, underground utility installation, and routine grading (Bouchard 2022). However, the presence of marine clam shells within the project alignment suggests there is potential for encountering intact subsurface archaeological deposits during project-related ground disturbances. Although the origin of the shell is unknown and there is no clear indication the shell is cultural, potential impacts to archaeological resources could occur in the event archaeological resources are unexpectedly discovered during project construction. Rincon recommends the following mitigation measures for addressing unanticipated discoveries. With adherence to the mitigation measures described below, Rincon recommends a finding of ***less than significant impact to archaeological resources with mitigation incorporated*** under CEQA. The project would also be required to adhere to existing regulations regarding the unanticipated discovery of human remains, as detailed below.

Recommended Mitigation Measures

Worker's Environmental Awareness Program

A qualified archaeologist shall be retained to conduct a Worker's Environmental Awareness Program (WEAP) training on archaeological sensitivity for all construction personnel prior to the commencement of ground-disturbing activities. The training shall be conducted by an archaeologist who meets the Secretary of Interior's Professional Qualification Standards for archaeology (National Park Service 1983). Archaeological sensitivity training shall include a description of the types of cultural material that may be encountered, cultural sensitivity issues, the regulatory environment, and the proper protocol for treatment of the materials in the event of a find.

Unanticipated Discovery of Cultural Resources

If archaeological resources are unexpectedly encountered during project-related ground-disturbing activities, work in the immediate area shall be halted and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archeology (National Park Service 1983) shall be contacted immediately to evaluate the find. If the find is prehistoric, then a Native American representative shall also be contacted to participate in the evaluation of the find. If necessary, the evaluation may require preparation of a treatment plan and archaeological testing for CRHR eligibility. If the discovery proves to be eligible for the CRHR and cannot be avoided by the proposed project, additional work, such as data recovery excavation, may be warranted to mitigate any significant impacts to historical resources.

Human Remains

No human remains are known to be present within the project site. However, the discovery of human remains is always a possibility during ground disturbing activities. If human remains are unexpectedly found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be of Native American origin, the Coroner will notify the Native American Heritage Commission, which will determine and notify a most likely descendant (MLD). The MLD has 48 hours from being granted site access to make recommendations for the disposition of the remains. If the MLD does not make recommendations within 48 hours, the landowner shall reinter the remains in an area of the property secure from subsequent disturbance. With adherence to existing regulations, Rincon recommends a finding of ***less than significant impact to human remains*** under CEQA.

If you have any questions regarding this cultural resources study, please do not hesitate to contact Rincon Archaeologist Mary Pfeiffer, BA, at (805) 644-4455 ext. 2052 or via email at mpfeiffer@rinconconsultants.com.

Sincerely,
Rincon Consultants, Inc.

Mary Pfeiffer, BA
Archaeologist

Ken Victorino, MA, RPA
Senior Principal Investigator

Christopher Duran, MA, RPA
Principal

Attachments

Attachment 1 Figures
Attachment 2 California Historical Resources Information System Records Search
Attachment 3 Native American Heritage Commission Documents

References

Bouchard, Jared

2022. General Manager, Pleasant Valley County Water District. Personal communication regarding previous disturbances along project alignment with Adam Bugielski, Project Manager, Michael K. Nunley & Associates. August 25, 2022.

CH2M Hill

2004 *Groundwater Recovery Enhancement and Treatment (GREAT) Program Cultural Resources Inventory Report*. Report on file at the South Central Coastal Information Center.

GoogleEarth

2022 Aerial Imagery, 34.17614444444444, -119.08139444444444. Accessed May 25, 2022, from www.earth.google.com.

Nationwide Environmental Title Research (NETR)

2022 Aerial photographs depicting the project site. Electronic document accessed May 20, 2022 from www.historicaerials.com.

National Park Service (NPS)

1983 Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. Electronic document accessed May 20, 2022 from https://www.nps.gov/history/local-law/arch_stnds_0.htm.

Schmidt, James J.

2012 *Archaeological Survey Report for Southern California Edison Company's Houweling Nursery Interconnection Project (IO 321669), New 16 kV Gen-Tie Line, Near Camarillo, Ventura County, CA*. Report on file at the South Central Coastal Information Center.

University of California, Santa Barbara (UCSB) Map and Imagery Lab

1932 Aerial Photograph Frame Finder. Flight # C_2300. Frame D-4. Electronic document accessed May 25, 2022, from http://mil.library.ucsb.edu/ap_indexes/FrameFinder/.

United States Geological Survey (USGS)

2022a 1904, Hueneme 1:62500 topographic map. Electronic document accessed May 20, 2022, from https://livingatlas.arcgis.com/topoexplorer/index.html

2022b 1943, Hueneme 1:62500 topographic map. Electronic document accessed May 20, 2022, from https://livingatlas.arcgis.com/topoexplorer/index.html

2022c 1950, Camarillo 1:24000 topographic map. Electronic document accessed May 20, 2022, from https://livingatlas.arcgis.com/topoexplorer/index.html

2022d 1967, Camarillo 1:2400 topographic map. Electronic document accessed May 20, 2022, from https://livingatlas.arcgis.com/topoexplorer/index.html

2022e 1982, Santa Barbara 1:100000 topographic map. Electronic document accessed May 20, 2022 from https://livingatlas.arcgis.com/topoexplorer/index.html

W and S Consultants

1994 *Phase I Archaeological Survey of the Proposed Hill Canyon 9.2 Mile Pipeline Corridor, Ventura County, California*. Report on file at the South Central Coastal Information Center.

Wlodarski, Robert J.

1995 *The Results of a Phase 1 Archaeological Study for Approximately 37 Acres, Located on the Southwest Corner of Los Posas Road and Laguna Road, City of Camarillo, County of Ventura, Californi*a. Report on file at the South Central Coastal Information Center.

Attachment 1

Figures

Figure 1 Regional Location Map

Imagery provided by Esri and its licensors © 2022.

Project Location

N

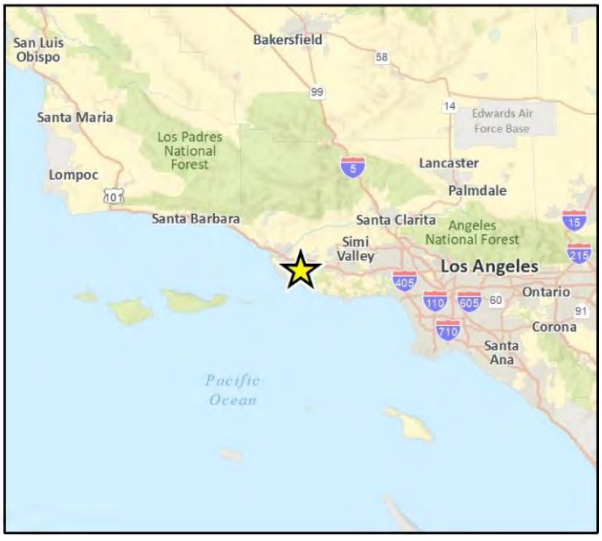
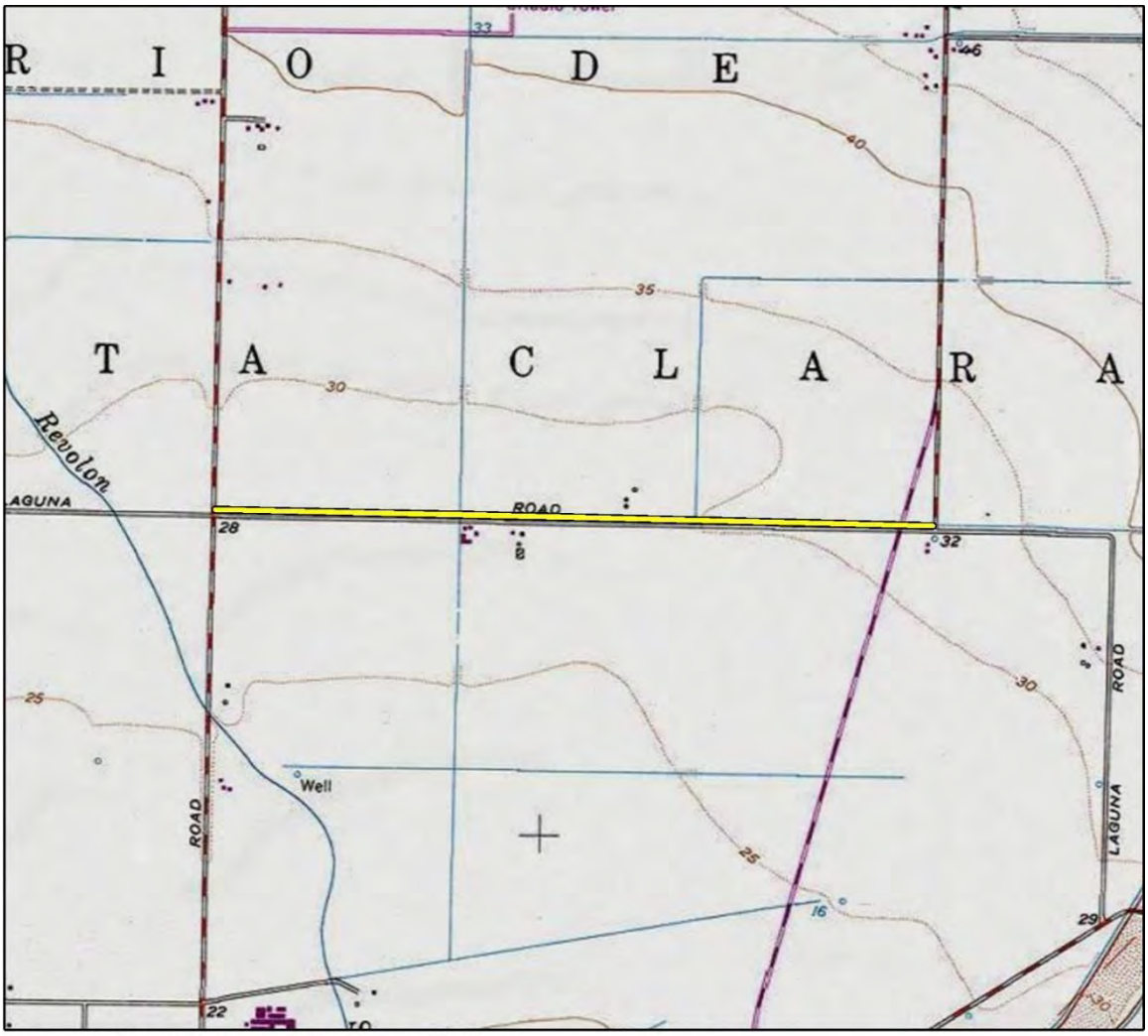


Figure 2 Project Location Map



Basemap provided by National Geographic Society, Esri and their licensors © 2022. Camarillo Quadrangle. T01N R21W S09,15,16. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.

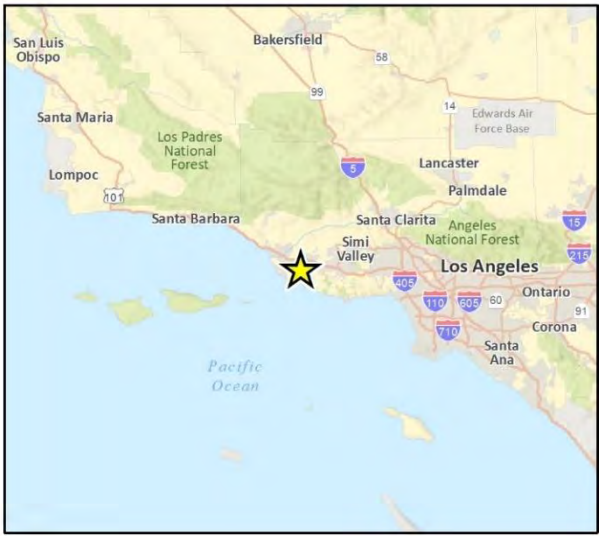


Figure 3 Modern Refuse Along Proposed Alignment, Facing Northeast

Figure 4 Modern Refuse Along Proposed Alignment, Facing West

Figure 5 Soil Within Project Site, Facing East

Figure 6 Soil Discoloration, Facing West

Figure 7 Underground Utility Within Project Site, Facing West

Figure 8 Underground Utility Within Project Site, Facing North

Figure 9 Underground Utility Within Project Site

Figure 10 Clam Shell Scatter Overview, Facing West

CONFIDENTIAL: PHOTO REDACTED DUE TO THE CONFIDENTIALITY OF POTENTIAL CULTURAL MATERIAL LOCATIONS

Figure 11 Shell Fragments, Planview

Figure 12 Shell Fragments, Planview

Figure 13 V-ditch Overview, Facing West

Figure 14 V-ditch Profile, Facing North

Figure 15 Mussel Shell Scatter Overview, Facing West

Figure 16 Mussel Shell, Planview

Attachment 2

California Historical Resources Information System Records Search

CHRIS Data Request Form

ACCESS AND USE AGREEMENT NO.: 56 **IC FILE NO.:** _____

To: South Central Coastal Information Center

Print Name: Mary Pfeiffer Date: 4/18/22

Affiliation: Rincon Consultants, Inc.

Address: 180 N. Ashwood Avenue

City: Ventura State: CA Zip: 93003

Phone: 805-644-4455 Fax: 805-644-4455 Email: mpfeiffer@rinconconsultants.com

Billing Address (if different than above): _____

Billing Email: ap@rinconconsultants.com Billing Phone: 805-644-4455

Project Name / Reference: Laguna Road 24-inch HDPE Pipeline Project

Project Street Address: N/A

County or Counties: Ventura

Township/Range/UTMs: Township 1N, Range 21W, Sections 8, 15 and 16

USGS 7.5' Quad(s): Camarillo

PRIORITY RESPONSE (Additional Fee): yes ☐ / no ■

TOTAL FEE NOT TO EXCEED: $600
(If blank, the Information Center will contact you if the fee is expected to exceed $1,000.00)

Special Instructions:

Please contact me if the total fee is expected to exceed $600

Information Center Use Only

Date of CHRIS Data Provided for this Request: _____

Confidential Data Included in Response: yes ☐ / no ☐

Notes: _____

CHRIS Data Request Form

Mark the request form as needed. Attach a PDF of your project area (with the radius if applicable) mapped on a 7.5' USGS topographic quadrangle to scale 1:24000 ratio 1:1 neither enlarged nor reduced and include a shapefile of your project area, if available. Shapefiles are the current CHRIS standard for submitting digital spatial data for your project area or radius. **Check with the appropriate IC for current availability of digital data products.**

- Documents will be provided in PDF format. Paper copies will only be provided if PDFs are not available at the time of the request or under specially arranged circumstances.
- Location information will be provided as a digital map product (Custom Maps or GIS data) unless the area has not yet been digitized. In such circumstances, the IC may provide hand drawn maps.
- In addition to the $150/hr. staff time fee, client will be charged the Custom Map fee when GIS is required to complete the request [e.g., a map printout or map image/PDF is requested and no GIS Data is requested, or an electronic product is requested (derived from GIS data) but no mapping is requested].

For product fees, see the CHRIS IC Fee Structure on the OHP website.

1. Map Format Choice:

Select One: Custom GIS Maps ☐ GIS Data ☒ Custom GIS Maps **and** GIS Data ☐ No Maps ☐

Any selection below left unmarked will be considered a "no. "

Location Information:

	Within project area	Within 0.5 mi. radius
ARCHAEOLOGICAL Resource Locations[1]	yes ☒ / no ☐	yes ☒ / no ☐
NON-ARCHAEOLOGICAL Resource Locations	yes ☒ / no ☐	yes ☒ / no ☐
Report Locations[1]	yes ☒ / no ☐	yes ☒ / no ☐
"Other" Report Locations[2]	yes ☐ / no ☒	yes ☐ / no ☒

3. Database Information:
(contact the IC for product examples, or visit the SSJVIC website for examples)

	Within project area	Within 0.5 mi. radius
ARCHAEOLOGICAL Resource Database[1]		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☐ / no ☒	yes ☐ / no ☒
Excel Spreadsheet	yes ☐ / no ☒	yes ☐ / no ☒
NON-ARCHAEOLOGICAL Resource Database		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☐ / no ☒	yes ☐ / no ☒
Excel Spreadsheet	yes ☐ / no ☒	yes ☐ / no ☒
Report Database[1]		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☐ / no ☒	yes ☐ / no ☒
Excel Spreadsheet	yes ☐ / no ☒	yes ☐ / no ☒
Include "Other" Reports [2]	yes ☐ / no ☒	yes ☐ / no ☒

4. Document PDFs (paper copy only upon request)**:**

	Within project area	Within 0.5 mi. radius
ARCHAEOLOGICAL Resource Records[1]	yes ☒ / no ☐	yes ☒ / no ☐
NON-ARCHAEOLOGICAL Resource Records	yes ☒ / no ☐	yes ☒ / no ☐
Reports[1]	yes ☒ / no ☐	yes ☐ / no ☒
"Other" Reports[2]	yes ☐ / no ☒	yes ☐ / no ☒

CHRIS Data Request Form

5. Eligibility Listings and Documentation:

	Within project area	Within 0.5 mi. radius
OHP Built Environment Resources Directory[3]:		
Directory listing only (Excel format)	yes ☐ / no ☒	yes ☐ / no ☒
Associated documentation[4]	yes ☐ / no ☒	yes ☐ / no ☒
OHP Archaeological Resources Directory[1,5]:		
Directory listing only (Excel format)	yes ☒ / no ☐	yes ☒ / no ☐
Associated documentation[4]	yes ☒ / no ☐	yes ☒ / no ☐
***California Inventory of Historic Resources* (1976):**		
Directory listing only (PDF format)	yes ☐ / no ☒	yes ☐ / no ☒
Associated documentation[4]	yes ☐ / no ☒	yes ☐ / no ☒

6. Additional Information:

The following sources of information may be available through the Information Center. However, several of these sources are now available on the OHP website and can be accessed directly. The Office of Historic Preservation makes no guarantees about the availability, completeness, or accuracy of the information provided through these sources. Indicate below if the Information Center should review and provide documentation (if available) of any of the following sources as part of this request.

Caltrans Bridge Survey	yes ☐ / no ☒
Ethnographic Information	yes ☐ / no ☒
Historical Literature	yes ☐ / no ☒
Historical Maps	yes ☐ / no ☒
Local Inventories	yes ☐ / no ☒
GLO and/or Rancho Plat Maps	yes ☐ / no ☒
Shipwreck Inventory	yes ☐ / no ☒
Soil Survey Maps	yes ☐ / no ☒

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[1] In order to receive archaeological information, requestor must meet qualifications as specified in Section III of the current version of the California Historical Resources Information System Information Center Rules of Operation Manual and be identified as an Authorized User or Conditional User under an active CHRIS Access and Use Agreement.

[2] "Other" Reports GIS layer consists of report study areas for which the report content is almost entirely non-fieldwork related (e.g., local/regional history, or overview) and/or for which the presentation of the study area boundary may or may not add value to a record search.

[3] Provided as Excel spreadsheets with no cost for the rows; the only cost for this component is IC staff time. Includes, but not limited to, information regarding National Register of Historic Places, California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and historic building surveys. Previously known as the HRI and then as the HPD, it is now known as the Built Environment Resources Directory (BERD). The Office of Historic Preservation compiles this documentation and it is the source of the official status codes for evaluated resources.

[4] Associated documentation will vary by resource. Contact the IC for further details.

[5] Provided as Excel spreadsheets with no cost for the rows; the only cost for this component is IC staff time. Previously known as the Archaeological Determinations of Eligibility, now it is known as the Archaeological Resources Directory (ARD). The Office of Historic Preservation compiles this documentation and it is the source of the official status codes for evaluated resources.

South Central Coastal Information Center
California State University, Fullerton
Department of Anthropology MH-426
800 North State College Boulevard
Fullerton, CA 92834-6846
657.278.5395 / FAX 657.278.5542
sccic@fullerton.edu
California Historical Resources Information System
Orange, Los Angeles, and Ventura Counties

5/18/2022 Records Search File No.: 23676.9777

Mary Pfeiffer
Rincon Consultants, Inc.
180 N. Ashwood Avenue
Ventura CA 93003

Re: Records Search Results for the Laguna Road 24-inch HDPE Pipeline Project

The South Central Coastal Information Center received your records search request for the project area referenced above, located on the Camarillo, CA USGS 7.5' quadrangle. Due to the COVID-19 emergency, we have temporarily implemented new records search protocols. With the exception of some reports that have not yet been scanned, we are operationally digital for Los Angeles, Orange, and Ventura Counties. See attached document for your reference on what data is available in this format. The following reflects the results of the records search for the project area and a ½-mile radius:

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☐ custom GIS maps ☒ shape files ☐ hand drawn maps

Resources within project area: 0	None
Resources within ½-mile radius: 0	None
Reports within project area: 4	VN-01341, VN-01403, VN-02978, VN-03109
Reports within ½-mile radius: 3	SEE ATTACHED LIST

Resource Database Printout (list):	☐ enclosed	☐ not requested	☒ nothing listed
Resource Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Digital Database (spreadsheet):	☐ enclosed	☒ not requested	☐ nothing listed
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Report Digital Database (spreadsheet):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Record Copies:	☐ enclosed	☐ not requested	☒ nothing listed
Report Copies:	☒ enclosed	☐ not requested	☐ nothing listed
OHP Built Environment Resources Directory (BERD) 2019:	☒ available online; please go to https://ohp.parks.ca.gov/?page_id=30338		
Archaeo Determinations of Eligibility 2012:	☐ enclosed	☐ not requested	☒ nothing listed
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed

Ethnographic Information: ☒ not available at SCCIC
Historical Literature: ☒ not available at SCCIC
GLO and/or Rancho Plat Maps: ☒ not available at SCCIC
Caltrans Bridge Survey: ☒ not available at SCCIC; please go to http://www.dot.ca.gov/hq/structur/strmaint/historic.htm
Shipwreck Inventory: ☒ not available at SCCIC; please go to http://shipwrecks.slc.ca.gov/ShipwrecksDatabase/Shipwrecks_Database.asp
Soil Survey Maps: (see below) ☒ not available at SCCIC; please go to http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

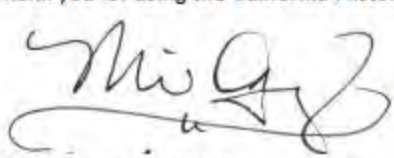
Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System,



Digitally signed by Michelle Galaz Cornforth
Date: 2022.05.18 13:19:58 -07'00'

Michelle Galaz Cornforth
Assistant Coordinator

Enclosures:

(X) Emergency Protocols for LA, Orange, and Ventura County BULK Processing Standards – 2 pages

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
VN-00347		1981	Hawthorne, Janice G.	Cultural Resource Reconnaissance and Impact Evaluation of a 14+ Mile Route for the Proposed Pumping Trough Pipeline and Lower Aquifer System Wells, County of Ventura, California	NARC	56-000546, 56-000665, 56-000726
VN-00491		1986	Toren, George A.	Cultural Resource Investigation: G.e. Evans No. 1 Exploratory Drill Site, Oxnard	Greenwood and Associates	
VN-01341		1995	Wlodarski, Robert J.	The Results of a Phase 1 Archaeological Study for Approximately 37 Acres, Located on the Southwest Corner of Los Posas Road and Laguna Road, City of Camarillo, County of Ventura, California	Historical, Environmental, Archaeological, Research, Team	
VN-01403		1994	Anonymous	Phase I Archaeological Survey of the Proposed Hill Canyon 9.2 Mile Pipeline Corridor, Ventura County, California	W & S Consultants	56-000214, 56-000215, 56-001073, 56-001152
VN-01410		1975	Briuer, Frederick L.	Assessment of the Archaeological Impact Revolon--Beardsley Projects	Northridge Archaeological Research Center, CSUN	56-000013, 56-000024, 56-000110, 56-000167, 56-000223, 56-000224
VN-02978		2004	Sharpe, Jim and Durio, Lori	Groundwater Recovery Enhancement and Treatment (GREAT) Program, Cultural Resources Inventory Report	CH2MHill	56-000506, 56-000662, 56-000664, 56-000665, 56-000666, 56-000726, 56-000789, 56-000918, 56-100060, 56-152779, 56-152780, 56-152781, 56-152782, 56-152783, 56-152784
VN-03109		2012	Schmidt, James	Archaeological Survey Report for Southern California Edison Company's Houwelling Nursery Interconnection Project, New 16kV Gen-Tie, near Camarillo, Ventura Co, CA	Compass Rose	

Attachment 3

Native American Heritage Commission Documents

Local Government Tribal Consultation List Request
Native American Heritage Commission

1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Type of List Requested

■ **CEQA Tribal Consultation List (AB 52) –** ***Per Public Resources Code § 21080.3.1, subs. (b), (d), (e) and 21080.3.2***

☐ **General Plan (SB 18) -** ***Per Government Code § 65352.3.***

Local Action Type:

___ General Plan ___ General Plan Element ___ General Plan Amendment

___ Specific Plan ___ Specific Plan Amendment ___ Pre-planning Outreach Activity

Required Information

Project Title: Laguna Road 24-inch HDPE Pipeline Project

Local Government/Lead Agency: Pleasant Valley County Water District

Contact Person: Mary Pfeiffer

Street Address: 180 N. Ashwood Avenue

City: Ventura **Zip:** 93003

Phone: (805) 644-4455 ext. 2052

Email: mpfeiffer@rinconconsultants.com

Specific Area Subject to Proposed Action

County/Community: Ventura County

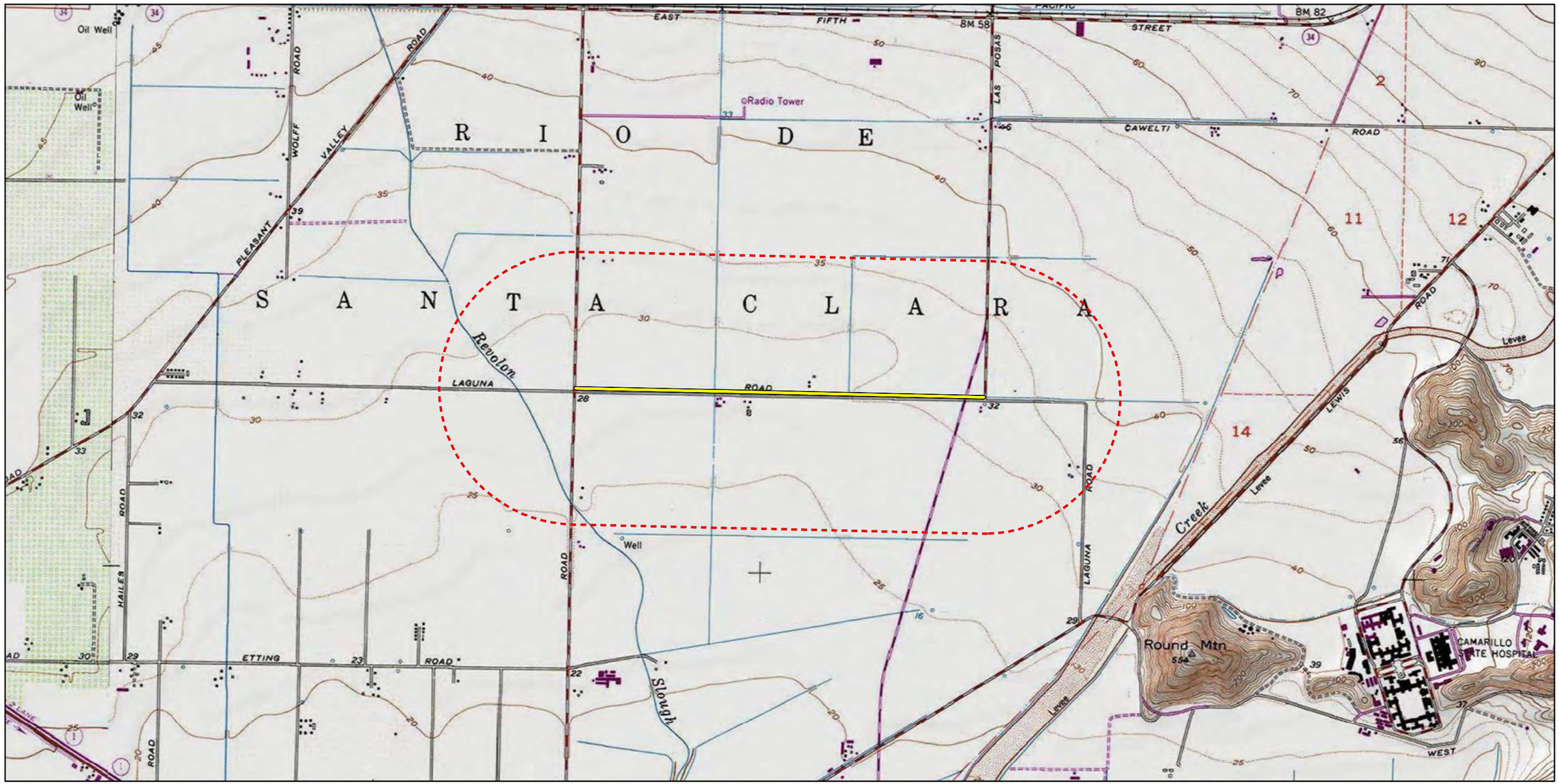
Additional Request

■ **Sacred Lands File Search -** ***Required Information:***

USGS Quadrangle Name(s): *Camarillo*

Township: 1 North **Range:** 21 West **Section(s):** 8, 15 and 16

Please see the attached map for reference



Imagery provided by National Geographic Society, ESRI and its licensors © 2022. Camarillo Quadrangle. T01.0N R21.0W S8-11,14-17. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.

Project Site

Half-Mile Buffer

N

0 1,000 2,000 Feet

0 250 500 Meters

1:24,000

Records Search Map

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

May 17, 2022

Mary Pfeiffer
Rincon Consultants, Inc.

Via Email to: mpfeiffer@rinconconsultants.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Laguna Road 24-inch HDPE Pipeline Project, Ventura County

Dear Ms. Pfeiffer:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

- Any report that may contain site forms, site significance, and suggested mitigation measures.

  All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

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 consultation list remains current.

If you have any questions, please contact me at my email address: Cody.Campagne@nahc.ca.gov.

Sincerely,

Cody Campagne

Cody Campagne
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
Ventura County
5/17/2022

Barbareno/Ventureno Band of Mission Indians
Julie Tumamait-Stenslie, Chairperson
365 North Poli Ave — Chumash
Ojai, CA, 93023
Phone: (805) 646 - 6214
jtumamait@hotmail.com

Chumash Council of Bakersfield
Julio Quair, Chairperson
729 Texas Street — Chumash
Bakersfield, CA, 93307
Phone: (661) 322 - 0121
chumashtribe@sbcglobal.net

Coastal Band of the Chumash Nation
Mariza Sullivan, Chairperson
P. O. Box 4464 — Chumash
Santa Barbara, CA, 93140
Phone: (805) 665 - 0486
cbcntribalchair@gmail.com

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 — Gabrielino
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street — Gabrielino
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Northern Chumash Tribal Council
Violet Walker, Chairperson
P.O. Box 6533 — Chumash
Los Osos, CA, 93412
Phone: (760) 549 - 3532
violetsagewalker@gmail.com

San Luis Obispo County Chumash Council
1030 Ritchie Road — Chumash
Grover Beach, CA, 93433

Santa Ynez Band of Chumash Indians
Kenneth Kahn, Chairperson
P.O. Box 517 — Chumash
Santa Ynez, CA, 93460
Phone: (805) 688 - 7997
Fax: (805) 686-9578
kkahn@santaynezchumash.org

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 Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Laguna Road 24-inch HDPE Pipeline Project, Ventura County.

Appendix D

Energy Calculations

Laguna Road Pipeline

10/19/2022

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Excavators	1	8	158	0.38	Demolition/Pavement Cutting	335
Tractors/Loaders/Backhoes	1	8	97	0.37	Demolition/Pavement Cutting	223
Graders	1	8	187	0.41	Site Preparation/Grading	1,712
Plate Compactors	1	8	8	0.43	Site Preparation/Grading	85
Rubber Tired Dozers	1	8	247	0.4	Site Preparation/Grading	2,206
Rubber Tired Loaders	1	8	203	0.36	Site Preparation/Grading	1,632
Plate Compactors	1	8	8	0.43	Infrastructure Installation	75
Rollers	1	8	80	0.38	Infrastructure Installation	660
Pavers	1	8	130	0.42	Paving/Site Restoration	457
Paving Equipment	1	8	132	0.36	Paving/Site Restoration	398
Rollers	1	8	80	0.38	Paving/Site Restoration	283
Rough Terrain Forklifts	1	8	100	0.4	Paving/Site Restoration	372
Skid Steer Loaders	1	8	65	0.37	Paving/Site Restoration	224
					Total Fuel Used	**8,662 (Gallons)**

Construction Phase	Days of Operation
Demolition/Pavement Cutting	13.2
Site Preparation/Grading	52.8
Infrastructure Installation	46.2
Paving/Site Restoration	19.8
Total Days	132

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition/Pavement Cutting	24.1	12	20.0	131.45
Site Preparation/Grading	24.1	12	20.0	525.81
Infrastructure Installation	24.1	12	20.0	460.08
Paving/Site Restoration	24.1	12	20.0	197.18
		Fuel		**1,314.52**

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Demolition/Pavement Cutting	7.5	0	20.0	0.00
Site Preparation/Grading	7.5	438	20.0	1168.00
Infrastructure Installation	7.5	0	20.0	0.00
Paving/Site Restoration	7.5	0	20.0	0.00
		Fuel		**1,168.00**
WATER TRUCK TRIPS				
Water Truck	7.5	10	10.0	1760.00
		Fuel		**1,760.00**

Total Gasoline Consumption (gallons)	**1,315**
Total Diesel Consumption (gallons)	**11,590**

Sources:

[1] United States Environmental Protection Agency. 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2* . September. Available at: https://www.epa.gov/system/files/documents/2021-08/420r21021.pdf.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2021. *National Transportation Statistics* . Available at: https://www.bts.gov/topics/national-transportation-statistics.

Appendix E

Noise Modeling

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 08/05/2022
Case Description:

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
1	Industrial	70.0	70.0	70.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	250.0	0.0
Grader	No	40	85.0		250.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Dozer	67.7	63.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	71.0	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	71.0	68.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Groundborne Noise and Vibration Modeling

Notes
The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure.

	Reference Level Inputs			
Equipment	**PPV_{ref} (in/sec)**	**Lv_{ref} (VdB)**	**RMS_{ref} (in/sec)**	**Reference Distance**
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	**Distance (feet)**	**PPV_x (in/sec)**	**Lv_x (VdB)**	**RMS_x (in/sec)**
Large bulldozer	100	0.0194	74	0.005
Loaded trucks	100	0.0165	70	0.003

	Vibration Contours		
	Distance to (feet)		
Equipment	**0.200 PPV**	**72.0 VdB**	**0.0080 RMS**
Large bulldozer	12	120	64
Loaded trucks	10	79	42

Source
California Department of Transportation (Caltrans). 2013. Transportation and Construction Last Updated: 4/11/2019

Groundborne Noise and Vibration Modeling

Notes
The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure.

	Reference Level Inputs			
Equipment	**PPV_{ref} (in/sec)**	**Lv_{ref} (VdB)**	**RMS_{ref} (in/sec)**	**Reference Distance**
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	**Distance (feet)**	**PPV_x (in/sec)**	**Lv_x (VdB)**	**RMS_x (in/sec)**
Large bulldozer	25	0.0890	87	0.022
Loaded trucks	25	0.0760	83	0.014

	Vibration Contours		
	Distance to (feet)		
Equipment	**0.200 PPV**	**72.0 VdB**	**0.0080 RMS**
Large bulldozer	12	120	64
Loaded trucks	10	79	42

Source
California Department of Transportation (Caltrans). 2013. Transportation and Construction Last Updated: 4/11/2019

Appendix B

30% Pipeline Preliminary Design Plan and Profile

PLEASANT VALLEY COUNTY WATER DISTRICT

Pleasant Valley County Water District

Construction Plans for

TASK ORDER NO. 2 - PIPELINE PRELIMINARY DESIGN

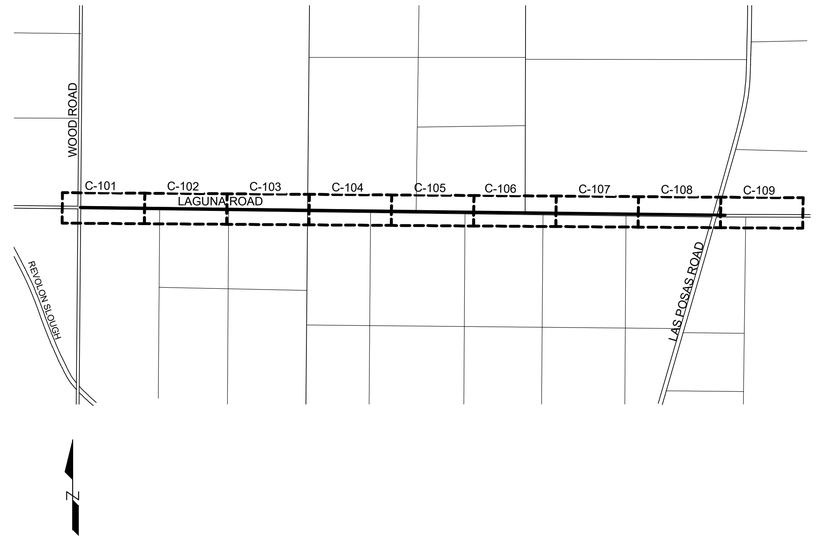
OCTOBER 2022

VICINITY MAP

NOT TO SCALE

SHEET INDEX

SHEET NO.	DISCIPLINE	DESCRIPTION
GENERAL		
1	G-001	TITLE SHEET, VICINITY MAP, SHEET INDEX AND LOCATION MAP
2	G-002	LEGEND, ABBREVIATIONS, AND NOTES
CIVIL		
6	C-101	PLAN & PROFILE STA. 10+00 TO STA. 18+00
7	C-102	PLAN & PROFILE STA. 18+00 TO STA. 28+00
8	C-103	PLAN & PROFILE STA. 28+00 TO STA. 38+00
9	C-104	PLAN & PROFILE STA. 38+00 TO STA. 48+00
10	C-105	PLAN & PROFILE STA. 48+00 TO STA. 58+00
11	C-106	PLAN & PROFILE STA. 58+00 TO STA. 68+00
12	C-107	PLAN & PROFILE STA. 68+00 TO STA. 78+00
13	C-108	PLAN & PROFILE STA. 78+00 TO STA. 88+00
14	C-109	PLAN & PROFILE STA. 88+00 TO STA. 89.51
15	C-110	CIVIL DETAILS



LOCATION AND KEY MAP

NOT TO SCALE

DWG. NO. G-001

811 Know what's below. Call before you dig.

CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA — DESIGNED
DATE 10/5/22 RWR — DRAFTED BY
DATE 10/5/22 JJR — CHECKED

PREPARED BY
10/5/22
RYAN GALLAGHER Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
TITLE SHEET, VICINITY MAP, SHEET INDEX AND LOCATION MAP

SHEET 1 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

DWG: N:\Pleasant Valley County Water District\PVCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Plansets\G-001.dwg USER: mobson
DATE: Oct 05, 2022 9:45am XREFS: G-BD IMAGES: LOCATION MAP.jpg PVCWD LOGO.png VICINITY MAP.jpg G-MLMAN.png

GENERAL NOTES:

1. CONSTRUCT PIPELINE AS INDICATED ON PLANS.
2. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES, PIPES, AND/OR STRUCTURES SHOWN ON THESE PLANS WAS OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ANY UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREIN. NOTICE OF PROPOSED WORK SHALL BE GIVEN TO THE AGENCIES LISTED ON THIS SHEET. THE CONTRACTOR SHALL CALL IN A LOCATION REQUEST TO UNDERGROUND SERVICE ALERT (USA) AT (800) 227-2600 TWO WORKING DAYS BEFORE PERFORMING ANY DIGGING.
3. THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD PLEASANT VALLEY COUNTY WATER DISTRICT (PVCWD) AND MKN (ENGINEER) HARMLESS FOR ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FORM THE SOLE NEGLIGENCE OF THE PVCWD OR ENGINEER.
4. THE CONTRACTOR SHALL NOT DISTURB EXISTING SURVEY MONUMENTS OR BENCHMARKS NOTED ON THE PLANS OR FOUND DURING CONSTRUCTION. REMOVAL AND REPLACEMENT SHALL BE DONE BY A REGISTERED CIVIL ENGINEER WITH AN R.C.E. OR A LICENSED LAND SURVEYOR ONLY.
5. ALL PUBLIC TRAVELED WAYS MUST BE CLEANED DAILY OF ALL DIRT, MUD, AND DEBRIS DEPOSITED ON THEM AS A RESULT OF THE PIPELINE CONSTRUCTION. CLEANING IS TO BE DONE TO THE SATISFACTION OF THE PVCWD ENGINEER.
6. AT NO TIME WILL PRIVATE PROPERTY BE USED IN CONJUNCTION WITH THE PROJECT UNLESS PROPERTY OWNER APPROVAL IS OBTAINED IN WRITING AND EVIDENCE OF SAME IS GIVEN TO PVCWD.
7. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL AT ALL TIMES MAINTAIN ALL ACCESS TO PUBLIC FACILITIES AND PRIVATE PROPERTY IN THE PROJECT AREA.
8. THE CONTRACTOR SHALL TAKE THE NECESSARY STEPS TO PROTECT THE PROJECT AND ADJACENT PROPERTY FROM ANY EROSION AND SILTATION RESULTING FROM HIS OPERATIONS BY APPROPRIATE MEANS (SAND BAGS, DIKES, SHORING, ETC.) UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY THE COUNTY OF VENTURA.
9. ALL EXISTING IMPROVEMENTS DISTURBED BY THE CONTRACTOR'S WORK INCLUDING BUT NOT LIMITED TO IRRIGATION, CURB, GUTTER, TREES, PAVEMENT, ETC. SHALL BE REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE UNLESS NOTED OTHERWISE.
10. UPON COMPLETION OF EACH DAY'S WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LEAVING THE WORK AREA FREE OF HAZARDS AND SHALL PROVIDE NECESSARY TEMPORARY SIGNS, WARNING DEVICES AND BARRICADES.
11. REMOVE AND RESTORE DAMAGED EXISTING ASPHALT PAVEMENT AND PAVEMENT STRIPING PER SPECIFICATIONS.
12. ALL EXISTING FACILITIES SHALL BE PROTECTED IN PLACE UNLESS SPECIFIED OTHERWISE IN THE PLANS OR BY OWNER.
13. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNERS OF THE CONSTRUCTION ACTIVITIES NEAR THE UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
14. CONSTRUCTION WORK HOURS ARE LIMITED TO 7:00 AM TO 5:00 PM, MONDAY THROUGH FRIDAY. WORK PROHIBITED ON SATURDAYS, SUNDAYS AND NATIONAL HOLIDAYS.
15. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THESE PLANS AND THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
16. ALL WORK DONE WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE DONE BY A CONTRACTOR WITH A CLASS A LICENSE.
17. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL NECESSARY PERMITS. PUBLIC WORKS TEMPORARY RIGHT-OF-WAY PERMITS ARE REQUIRED FOR ANY UTILITY TRENCHING, CRANES, DUMPSTERS, ETC. ON PUBLIC PROPERTY. THE PUBLIC WORKS PERMIT MUST BE ON THE JOB SITE AND AVAILABLE FOR REVIEW BY PVCWD OFFICIALS AT ALL TIMES. IF ANY WORK HAS BEGUN BEFORE OBTAINING A PERMIT, THE JOB WILL BE STOPPED UNTIL THE PERMIT IS OBTAINED.
18. ALL EQUIPMENT SHALL BE REMOVED FROM PROJECT SITE AT THE END OF EACH WORKING DAY AND ROADS OPENED TO VEHICULAR TRAFFIC UNLESS OTHERWISE APPROVED BY PVCWD.
19. ALL CONSTRUCTION TO BE IN CONFORMANCE WITH THE REGULATIONS OF CAL-OSHA.
20. LOOSE EXCAVATED MATERIAL SHALL NOT BE PLACED OR STORED IN WATERWAYS OR STORM DRAIN CHANNELS. ALL EXCAVATED MATERIAL SHALL BE REMOVED AND DISPOSE IF IN A PROPER AND LEGAL MANNER BY THE CONTRACTOR
21. IF GROUNDWATER IS ENCOUNTERED, CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING ACCESS PITS AND TRENCHES AND DISPOSE OF WATER AS REQUIRED BY THE DISTRICT AND APPLICABLE NPDES PERMITS, FEDERAL, STATE, AND LOCAL GOVERNMENT REQUIREMENTS.

STANDARD TRAFFIC CONTROL / TRAFFIC STRIPING NOTES

1. ALL TRAFFIC CONTROL SHALL BE IN PLACE PRIOR TO ENCROACHING INTO ANY STREETS.
2. ALL TRAFFIC CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD).
3. ALL STRIPING MUST COMPLY WITH VENTURA COUNTY'S STANDARD SPECIFICATIONS.
4. DRIVEWAYS AND INTERSECTIONS SHALL BE KEPT OPEN TO TRAFFIC AT ALL TIMES. CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF ONE WEEK PRIOR TO PREFORMING ANY CONSTRUCTION WHICH WILL IMPEDE THE NORMAL ACESS TO THEIR DRIVEWAYS.

PIPELINE NOTES

1. RECYCLED WATER WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS AND MATERIALS AS PROVIDED IN SPECIFICATIONS.
2. ALL TRENCH REPAIR BACKFILLS, AND COMPACTION SHALL BE INSPECTED BY THE OWNER. THE CONTRACTOR SHALL ALWAYS COMPLY WITH ALL CAL-OSHA SAFETY STANDARDS.
3. ALL DESIGN CHANGES SHALL BE APPROVED BY THE DISTRICT IN WRITING PRIOR TO CONSTRUCTION AND ACCEPTANCE OF THE CHANGE.
4. PIPELINE SHALL BE PRESSURE TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SECTION 400515. TEST PRESSURE SHALL BR 150 PSI.
5. IF ASBESTOS CEMENT PIPE MUST BE CUT AND HANDLED IN THE FIELD TO ACCOMPLISH THE WORK, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR AND SHALL TAKE ALL APPROPRIATE PRECAUTIONS FOR PROTECTING AGAINST THREATS TO HEALTH AND SAFETY OF THE WORK FORCE AND GENERAL PUBLIC ARISING OUT OF CONSTRUCTION INVOLVING ASBESTOS. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CALIFORNIA STATE, CAL/OSHA AND GOVERNMENT HEALTH AGENCY REGULATIONS FOR THE HANDLING, CUTTING, TAPPING, SHAPING, INSTALLATION AND DISPOSAL OF ASBESTOS. ASBESTOS CEMENT PIPE TO BE DISPOSED SHALL BE PROPERLY MANIFESTED, PREPARED FOR TRANSPORT FOLLOWING CRITERIA OF COUNTY OF VENTURA DEPARTMENT OF PUBLIC WORKS, SOLID WASTE DIVISION, AND DELIVERED TO A LANDFILL PERMITTED FOR DISPOSAL OF NON-FRIABLE ASBESTOS CONTAINING MATERIALS. THE COMPLETED GENERATOR COPY (YELLOW) MANIFEST SHALL BE RETURNED TO THE DISTRICT'S REPRESENTATIVE.
6. ANY AND ALL UTILITY VALVE COVERS, INCLUDING VALVE BOXES, AND CONCRETE COLLARS, SHALL BE RAISED TO GRADE WITHIN THE LIMITS OF STREET RESURFACING AREA.
7. CONTRACTOR SHALL PROTECT ALL EXISITNG OVERHEAD UTILITES.
8. ADJUST ALL VALVE BOXES TO FINISHED SURFACE/ GRADE.
9. COMBINATION AIR VACUUM ASSEMBLIES (AIR-VACS) SHALL BE INSTALLED AT LOCAL HIGH POINTS. ALTHOUGH THE GENERAL LOCATION OF AIR-VACS ARE INDICATED ON THE DRAWINGS, PRECISE LOCATIONS MAY BE ADJUSTED IN THE FIELD.
10. BLOW-OFF ASSEMBLIES (AIR-VACS) SHALL BE INSTALLED AT LOCAL LOW POINTS. ALTHOUGH THE GENERAL LOCATION OF BLOW-OFFS ARE INDICATED ON THE DRAWINGS, PRECISE LOCATIONS MAY BE ADJUSTED IN THE FIELD, WITH PVCWD APPROVAL.
11. ALL JACKING AND RECEIVING PITS SHALL BE BACKFILLED WITH TRENCH SLURRY BACKFILL CLASS 100-E-100 PER VENTURA COUNTY PLATE E-11 ON SHEET 31.
12. CONTRACTOR IS RESPONSIBLE FOR SIZING OF JACKING & RECEIVING PITS ACCORDING TO THE SITE CONDITION.
13. TO PREVENT DIRECT HUMAN CONSUMPTION OF RECYCLED WATER THROUGH ADHERENCE TO ALL APPLICABLE RULES AND REGULATIONS IN ACCORDANCE WITH TITLE 22. POSTING OF IDENTIFICATION SIGNS BY THE CUSTOMER IN ACCORDANCE WITH TITLE 22. CROSS-CONNECTION/ BACKFLOW PREVENTION AND TESTING PROGRAMS IN ACCORDANCE WITH TITLE 17. TAGGING AND COLOR CODING RECYCLED WATER EQUIPMENT IN ACCORDANCE WITH TITLE 22.

SURVEY NOTES

SITE SURVEY DATED APRIL 2022 AND PREPARED BY ENCOMPASS CONSULTANT GROUP (ECG).

1. MAPPING

TOPOGRAPHIC MAPPING WAS COMPILED AT A SCALE OF 1"=40', WITH A 1 FOOT CONTOUR INTERVAL, USING STANDARD PHOTOGRAMMETRIC METHODS AND PROCEDURES BY AEROTECH MAPPING INC. FROM AERIAL PHOTOGRAPHY OBTAINED ON APRIL 13, 2022.

MAPPING IS SUPPLEMENTED BY DATA COLLECTED FROM A FIELD SURVEY USING REAL TIME KINEMATIC GPS EQUIPMENT AND PROCEDURES IN APRIL, 2022, AT THE REQUEST OF MKN & ASSOCIATES.

AERIAL PHOTOGRAPHY
THE AERIAL PHOTOGRAPHY USED AS THE BACKGROUND FOR THIS MAP WAS OBTAINED ON APRIL 13, 2022 BY AEROTECH MAPPING INC.. THE PHOTOGRAPHY HAS BEEN CONVERTED INTO A DIGITAL FORMAT AND CORRECTED FOR HORIZONTAL AND VERTICAL DISTORTION USING STANDARD PHOTOGRAMMETRIC METHODS.

2. RECORD COMPILED BOUNDARY AND EASEMENTS

THE CENTERLINE AND RIGHT OF WAY LINES SHOWN HEREON ARE BASED UPON RECORD COMPILED INFORMATION SHOWN ON VARIOUS RECORD MAPS AND DOCUMENTS, IN THE COUNTY OF VENTURA. THIS INFORMATION HAS BEEN TRANSLATED AND ROTATED TO BEST FIT SEVERAL MONUMENTS OF RECORD THAT WERE LOCATED AS A PART OF THE FIELD SURVEY AND TIED TO THE SURVEY CONTROL SHOWN HEREON. THIS SURVEY DOES NOT CONSTITUTE A BOUNDARY ESTABLISHMENT SURVEY.

3. BASIS OF BEARINGS AND COORDINATES

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM NAD83, ZONE 5, EPOCH 2017.50 AS DETERMINED LOCALLY BY A LINE BETWEEN CONTINUOUS GLOBAL POSITIONING STATIONS (CGPS) AND/OR CONTINUOUS OPERATING REFERENCE STATIONS (CORS) CSCI & TOST BEING NORTH 65°12'25.61" EAST AS DERIVED FROM GEODETIC VALUES PUBLISHED BY THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC).

4. ELEVATIONS

THE VERTICAL DATUM OF THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), PER GPS TIES & GEOID MODELING (GEOID12B) TO CGPS STATION VNCO. ELLIPSOID HEIGHTS ARE CONSTRAINED PER CSRC. NO COUNTY BENCHMARKS WERE MEASURED IN THIS SURVEY.

5. UTILITIES

SURFACE UTILITY FEATURES SHOWN HEREON WERE LOCATED AS A PART OF THE FIELD SURVEY PERFORMED BY ECG BASED ON VISIBILITY ON THE DATE OF SURVEY. NO RESEARCH OR MAPPING OF SUBSURFACE UTILITIES HAS BEEN PERFORMED.

UTILITY AGENCY CONTACTS

CABLE
FRONTIER COMMUNICATIONS
32477 HAUN ROAD,
MENIFEE, CA 92584
(951) 723-0736

CABLE
CROWN CASTLE
1500 CORPORATE DR.
CANONSBURG, PA
(800) 654-3110

SC GAS
9400 OAKDALE AVENUE
CHATSWORTH, CA 91311
(818) 701-3448

SCE
1444E. MCFADDEN AVE.
SANTA ANA, CA 92705
(909) 233-9831

COUNTY OF VENTURA
800 S. VICTORIA AVE.
VENTURA, CA 93009
(805) 654-2087

WATER / SEWER
PVCWD
154 S Las Posas Rd, Camarillo, CA 93010
(805) 482-2119

CAMROSA WATER DISTRICT
7385 Santa Rosa Rd,
Camarillo, CA 93012
(805) 482-8673

U.S.A. LOCATING:
811

LEGEND

SYMBOLS

- BACK FLOW PREVENTER
- BOLLARD
- DRAIN INLET
- FIRE HYDRANT
- GAS METER
- WATER METER
- TELEPHONE MANHOLE
- FIBER OPTIC MANHOLE
- STORM DRAIN MANHOLE
- SEWER MANHOLE
- MANHOLE CATV
- CABLE TV PULLBOX
- COMMUNICATION PULLBOX
- ELECTRIC PULLBOX
- GAS PULLBOX
- STREET LIGHT PULLBOX
- TRAFFIC SIGNAL PULLBOX
- WATER PULLBOX
- BLOWOFF
- CATCH BASIN

Symbol	Description
	LIGHT POLE
	TRAFFIC SIGNAL ARM
	TRAFFIC SIGNAL
UP	POLE - UTILITY
RISER	UTILITY RISER
SCO	SEWER CLEAN OUT
SIGN	SIGN
SIGN	SIGN W/ DOUBLE POST
	TREE
	UTILITY MARK
GV	GAS VALVE
ICV	IRRIGATION CONTROL VALVE
V	VALVE (UNSPECIFIED)
WV	WATER VALVE
CP1	CONTROL POINT
	FOUND MONUMENT AS NOTED
2529.43 TC	SPOT ELEVATION (GROUND SURVEY)
2529.4	SPOT ELEVATION (GROUND SURVEY)
× 382.2	SPOT ELEVATION (AERIAL SURVEY)
	HDD BORING/RECEIVING PIT
	JACKING/RECEIVING PIT

LINETYPES

Linetype	Description
	BOUNDARY LINE
	EDGE OF DIRT
	RIGHT OF WAY LINE
	DITCH
	EDGE OF CONCRETE
	BUILDING FACE
	CONTOUR LINE
	CENTERLINE
	EDGE OF PAVEMENT
	CHAINLINK/BARBWIRE FENCE
	EDGE OF FIELD
	EDGE OF VEGETATION
8"G	NATURAL GAS (SIZE)
12" RCP SD	STORM DRAIN (SIZE AND MATERIAL)
T	TELEPHONE
10" AC W	WATER (SIZE AND MATERIAL)
[OHE]	OVERHEAD ELECTRICAL
[OHCTV]	OVERHEAD CABLE TELEVISION
	ABANDON IN PLACE
	REMOVE AND DISPOSE

ABBREVIATIONS

ABDN	ABANDON
AC	ASPHALT CONCRETE OR ASBESTOS-CEMENT
AGG	AGGREGATE
APPROX	APPROXIMATE
ASTM	ASTM INTERNATIONAL
AWWA	AMERICAN WATER WORKS ASSOCIATION
BO	BOTTOM OF
BC	CURVE BEGINNING
CALOSHA	THE DIVISION OF OCCUPATIONAL SAFETY AND HEALTH AT CALIFORNIA
CIP	CAST IRON PIPE
CLR	CLEARANCE
CONC	CONCRETE
CTR.	CENTER
℄ OR CL.	CENTERLINE
DEFL	DEFLECTION
DIA OR Ø	DIAMETER
E:	EASTING
E	EXISTING
EC	CURVE END
EL	ELEVATION
EP	EDGE OF PAVEMENT
EG	EXISTING GRADE
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOW LINE OR FLANGE
FS	FINISHED SURFACE
GB	GRADE BREAK
INV	INVERT
MAX	MAXIMUM
MIN	MINIMUM
MJ	MECHANICAL JOINT
N	NEW
OHW	OVERHEAD WIRE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PC	TANGENT-CURVE INTERSECTION
PCC	COMPOUND CURVE-CURVE INTERSECTION
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PT	CURVE-TANGENT INTERSECTION
PVC	POLYVINYL CHLORIDE
RCP	REINFORCE CONCRETE PIPE
RG	ROUGH GRADE
R/W	RIGHT-OF-WAY
SCH	SCHEDULE
SS	STAINLESS STEEL
SSCO	SANITARY SEWER CLEAN-OUT
SSMH	SANITARY SEWER MANHOLE
STA	STATION
STD	STANDARD
TC	TOP OF CURB
THK	THICK
TO	TOP OF
TYP	TYPICAL
UNK	UNKNOWN
WM	WATER METER
WV	WATER VALVE

DWG. NO. G-002

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

811 CALL 811 AT LEAST TWO DAYS BEFORE YOU DIG
Know what's below. Call before you dig.
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA DESIGNED
DATE 10/5/22 RWR DRAFTED BY
DATE 10/5/22 JJR CHECKED

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT

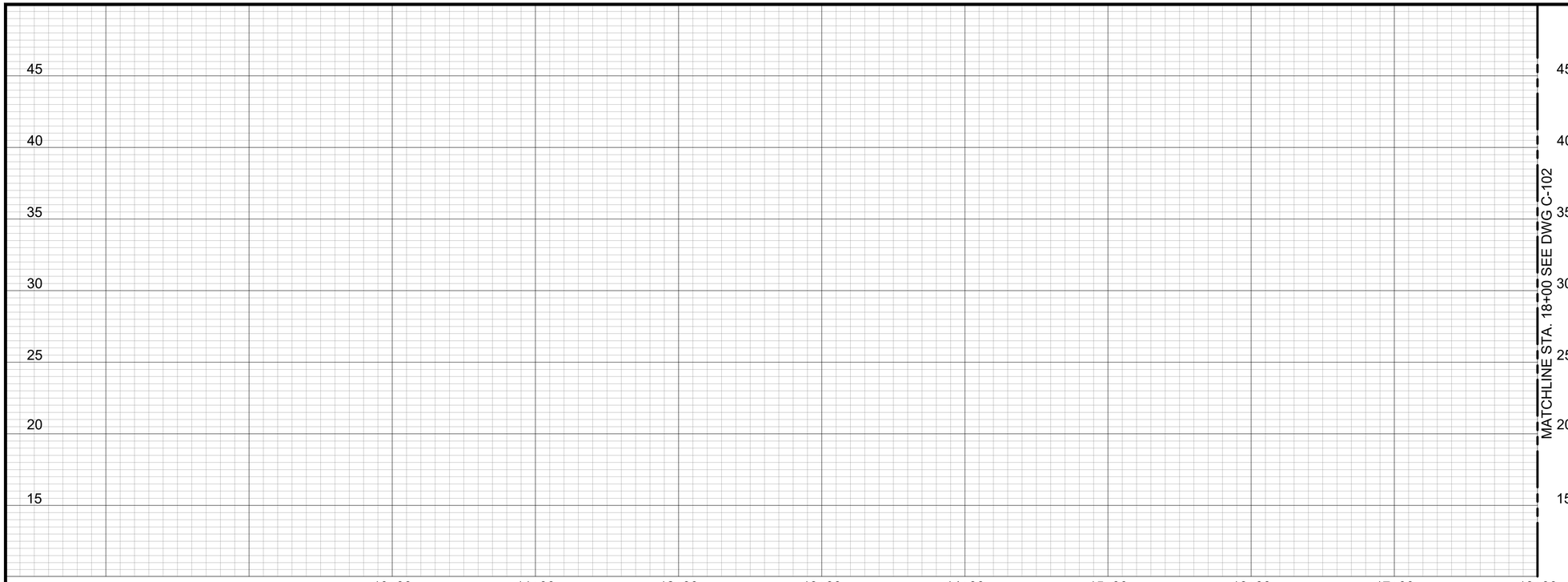
LEGEND, ABBREVIATIONS, AND NOTES

SHEET 2 OF 15

DWG: N:\Pleasant Valley County Water District\PVCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Planset\G-002.dwg USER: rrobison
DATE: Oct 05, 2022 9:49am XREFS: G-BD IMAGES: G-M-MKN.png

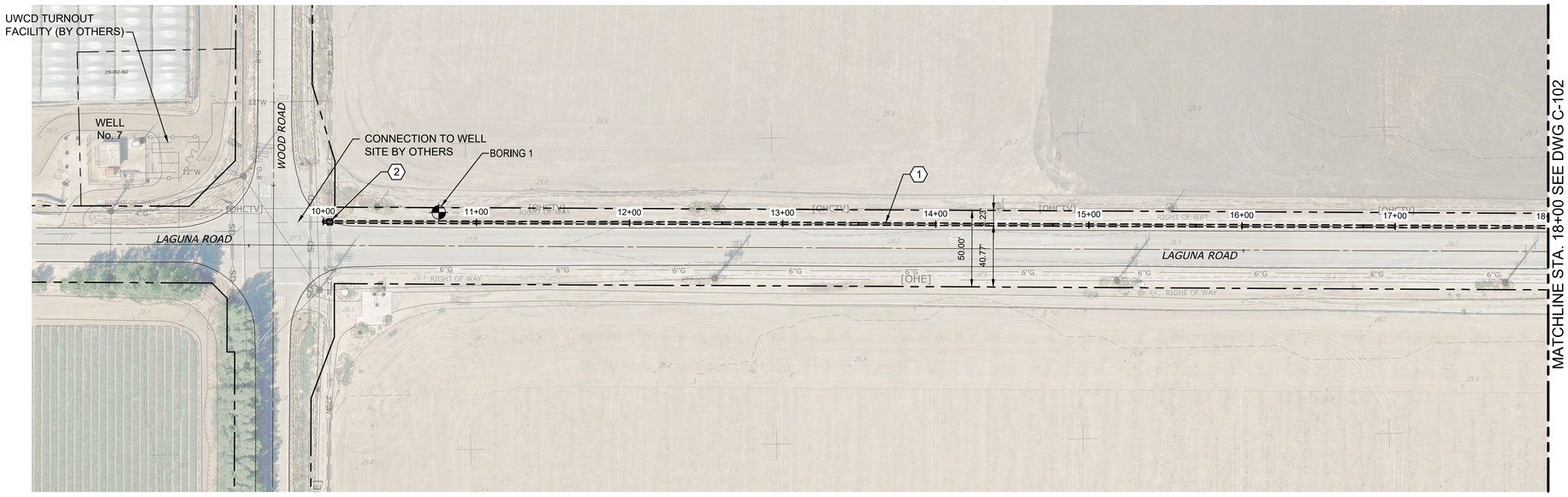
CONSTRUCTION NOTES

1. CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVEMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.
2. CONNECT TO EXCISING 27-INCH PCCP PER DETAIL X ON SHEET C-50X.



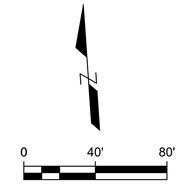
PROFILE

SCALE: HORIZ 1" = 40'
VERT 1" = 4'



PLAN

SCALE: 1" = 40'



DWG. NO. C-101

CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
Know what's below. Call before you dig.
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DESIGNED: PA — DATE 10/5/22
DRAFTED BY: RWR — DATE 10/5/22
CHECKED: JJR — DATE 10/5/22

PREPARED BY
RYAN GALLAGHER — 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 10+00 TO STA. 18+00

SHEET 6 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

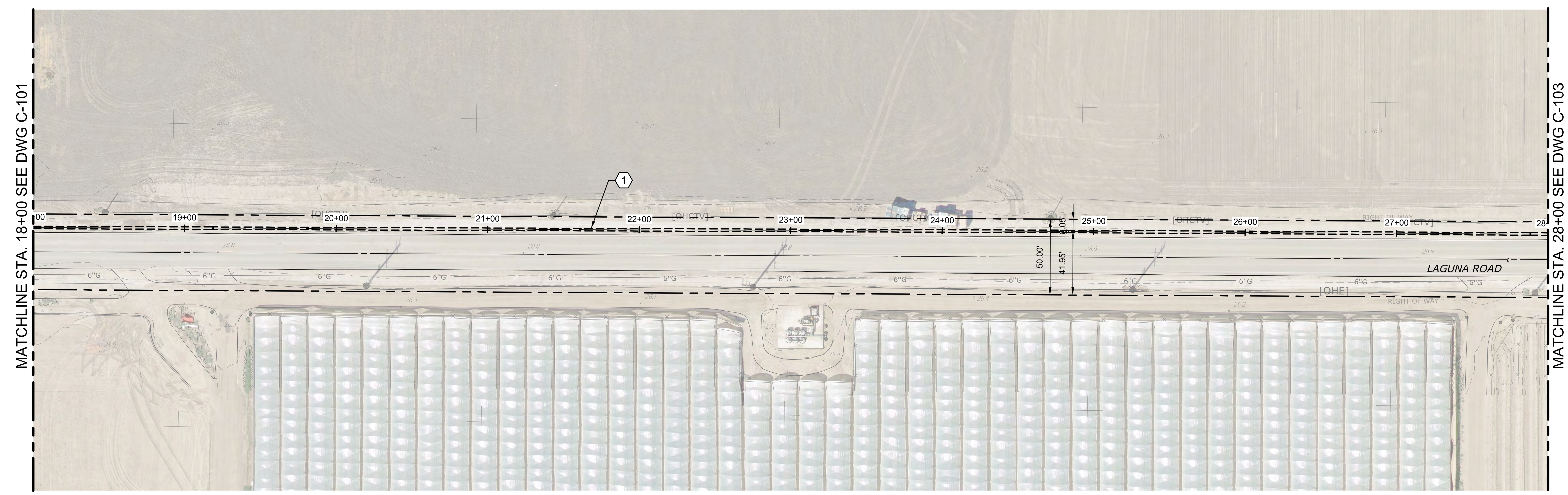
DWG: N:\Pleasant Valley County Water District\PVCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Plansets\C-1.dwg USER: mbloson
DATE: Oct 05, 2022 9:49am XREFS: G-BD CUTIL CAERIAL CALGN C-TOPO IMAGES: G-HMKN.png CAM22-088-Image.jpg

PROFILE

SCALE: HORIZ 1" = 40'
VERT 1" = 8'

CONSTRUCTION NOTES

(1) CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVEMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.



PLAN

SCALE: 1" = 40'

0 40' 80'

DWG. NO. C-102

CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
Know what's below. Call before you dig.
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA DESIGNED
DATE 10/5/22 RWR DRAFTED BY
DATE 10/5/22 JJR CHECKED

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 18+00 TO STA. 28+00

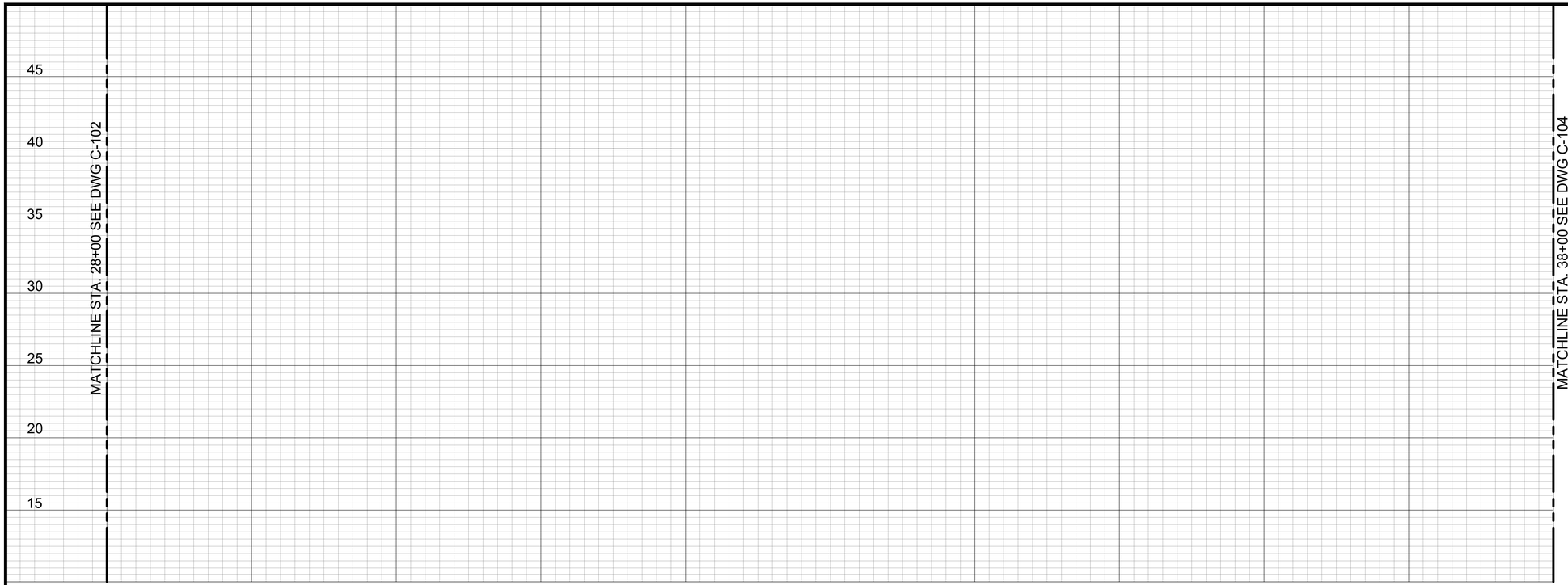
SHEET 7 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

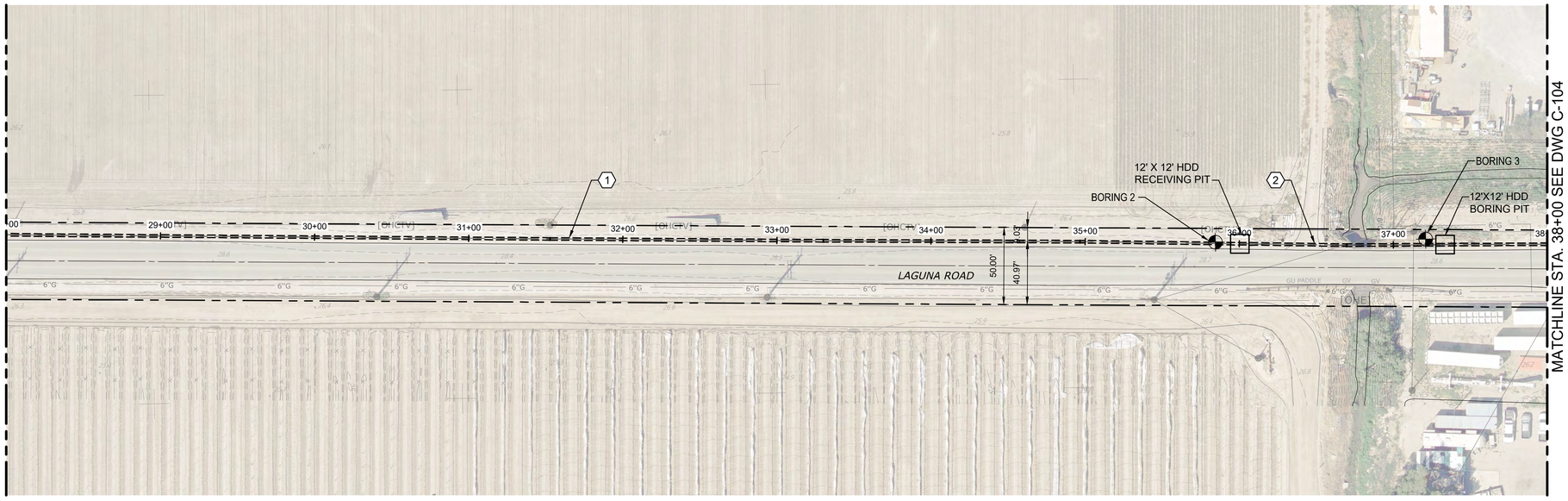
DWG: N:\Pleasant Valley County Water District\PVCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Plansets\C-2.dwg USER: rrobison
DATE: Oct 05, 2022 9:50am XREFS: G-BD C-UTIL C-AERIAL C-ALGN C-TOPO IMAGES: G-IM-MKN.png CA0422-088-Image.jpg

CONSTRUCTION NOTES

1. CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.
2. CONSTRUCT 18-INCH PVC C900/RJ CERTA-LOK PIPE, RESTRAIN ALL JOINTS



PROFILE
SCALE: HORIZ 1" = 40'



PLAN
SCALE: 1" = 40'

N
0 40' 80'

DWG. NO. C-103

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

DWG: N:\Pleasant Valley County Water District\PVCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Planset\C-3.dwg USER: mobison
DATE: Oct 05, 2022 9:51am XREFS: G-BD CUTIL CAERIAL CALGN OTOPO IMAGES: G-HUMAN.png OA422-388-Image.jpg

811 Know what's below. Call before you dig.
CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DESIGNED: PA — DATE 10/5/22
DRAFTED BY: RWR — DATE 10/5/22
CHECKED: JJR — DATE 10/5/22

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 28+00 TO STA. 38+00

PROFILE

SCALE: HORIZ 1" = 40'
VERT 1" = 8'

CONSTRUCTION NOTES

(1) CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVEMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.

PLAN

SCALE: 1" = 40'

0 40' 80'

DWG. NO. C-104

CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
Know what's below. Call before you dig.
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA DESIGNED
DATE 10/5/22 RWR DRAFTED BY
DATE 10/5/22 JJR CHECKED

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

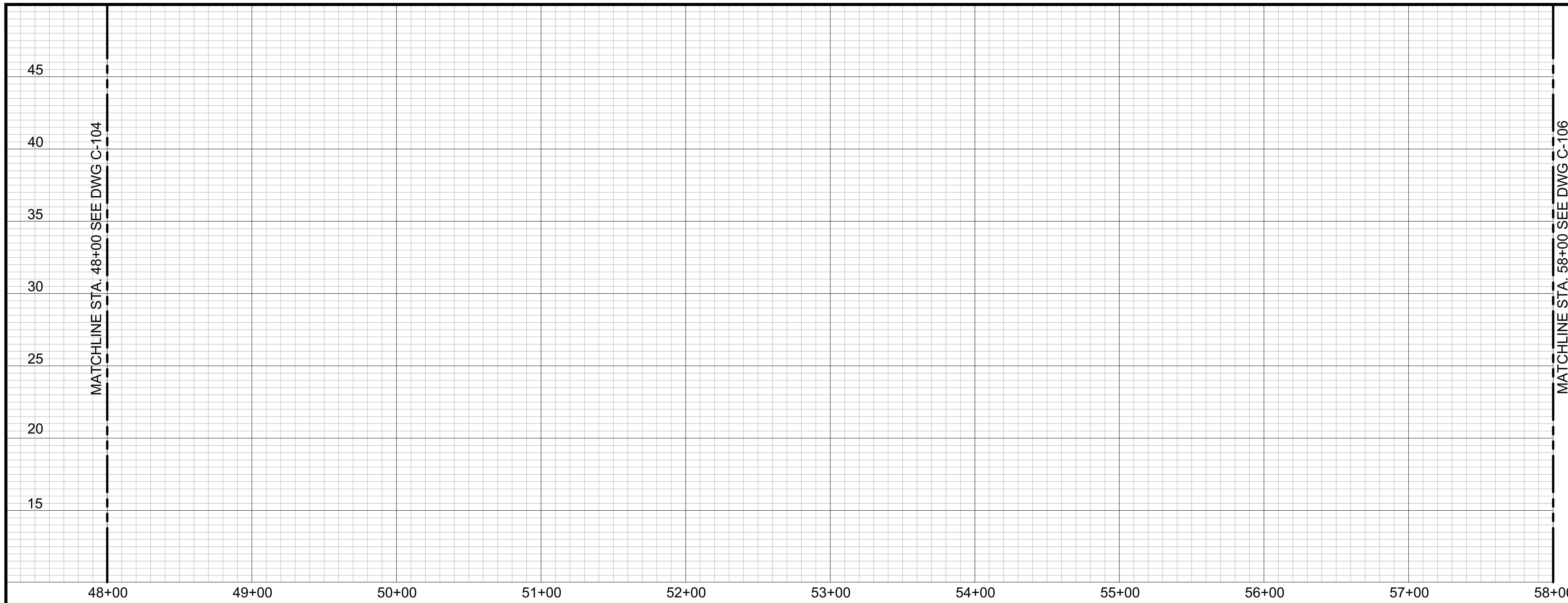
PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 38+00 TO STA. 48+00

SHEET 9 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

DWG: N:\Pleasant Valley County Water District\PVCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Plansets\C-4.dwg USER: rrobison
DATE: Oct 05, 2022 9:51am XREFS: G-BD C-UTIL C-AERIAL C-ALGN C-TOPO IMAGES: G-IM-MKN.png CA0422-088-Image.jpg

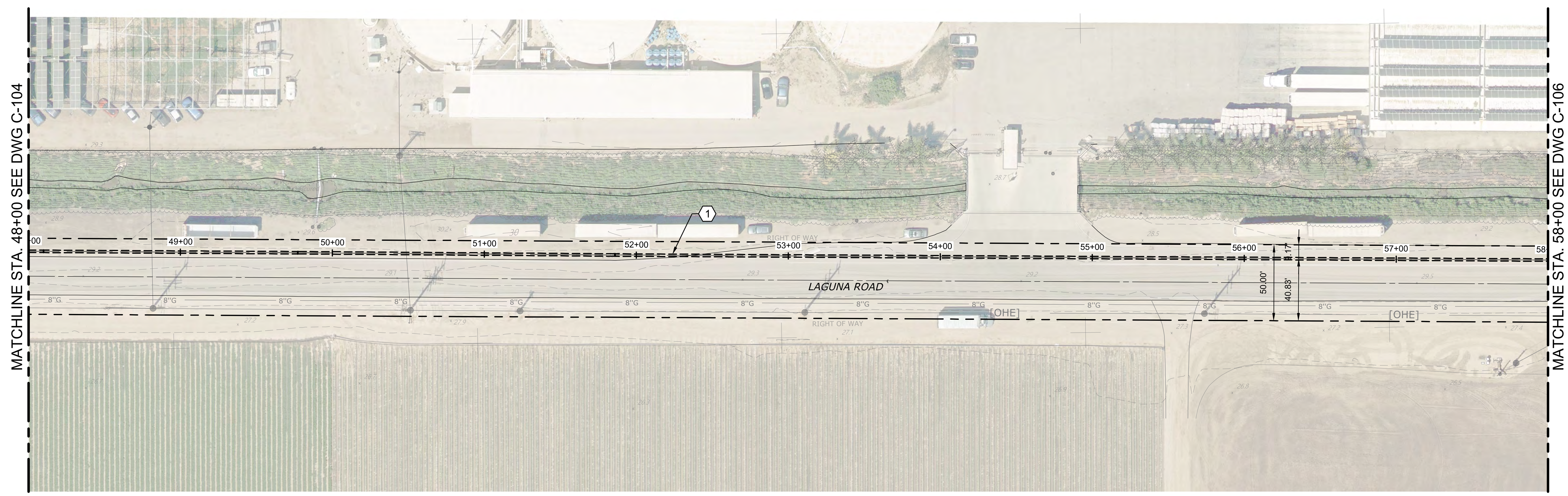


PROFILE

SCALE: HORIZ 1" = 40'
VERT 1" = 8'

CONSTRUCTION NOTES

1. CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVEMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.



PLAN

SCALE: 1" = 40'

0 40' 80'

DWG. NO. C-105

CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
Know what's below. Call before you dig.
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA DESIGNED
DATE 10/5/22 RWR DRAFTED BY
DATE 10/5/22 JJR CHECKED

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

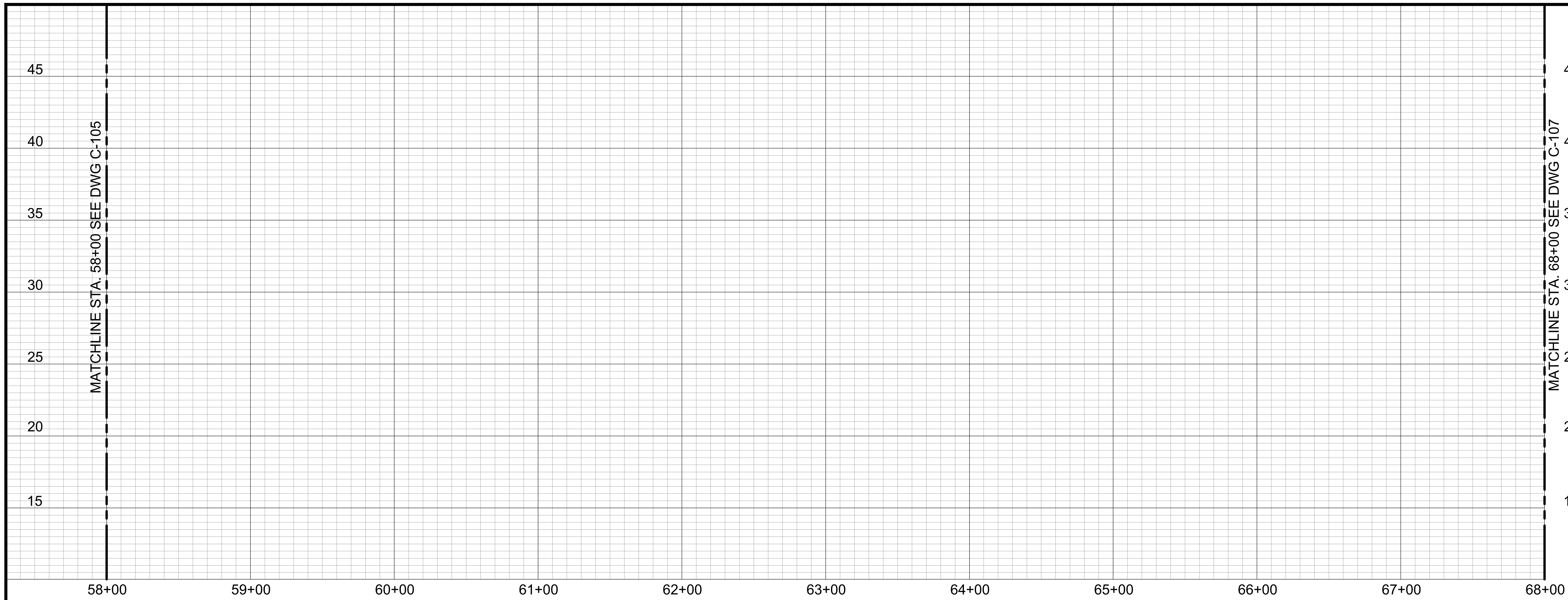
PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 48+00 TO STA. 58+00

SHEET 10 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

DWG: N:\Pleasant Valley County Water District\PVCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Plansets\C-5.dwg USER: mrobison
DATE: Oct 05, 2022 9:52am XREFS: G-BD C-UTIL C-AERIAL C-ALGN C-TOPO IMAGES: G-IM-MKN.png CA0422-088-Image.jpg



PROFILE

SCALE: HORIZ 1" = 40'
VERT 1" = 8'

CONSTRUCTION NOTES

1. CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVEMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.
2. ABANDON IN PLACE EXISTING 8-INCH WATER.
3. RECONNECT TO EXISTING SERVICE WATER PER DETAIL X ON SHEET C-50X.

PLAN

SCALE: 1" = 40'

0 40' 80'

N

DWG. NO. C-106

CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
Know what's below. Call before you dig.
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA DESIGNED
DATE 10/5/22 RWR DRAFTED BY
DATE 10/5/22 JJR CHECKED

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 58+00 TO STA. 68+00

SHEET 11 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

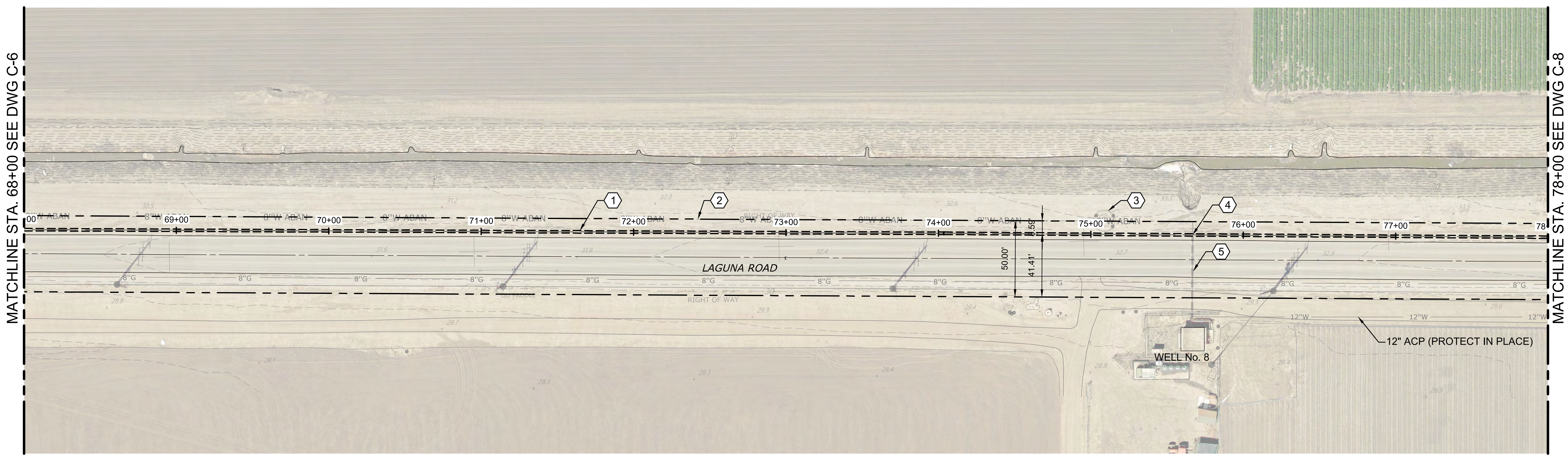
DWG: N:\Pleasant Valley County Water District\PVCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Planset\C-6.dwg USER: rrobison
DATE: Oct 05, 2022 9:52am XREFS: G-BD C-UTIL C-AERIAL C-ALGN C-TOPO IMAGES: G-IM-MKN.png CA0422-088-Image.jpg

PROFILE

SCALE: HORIZ 1" = 40'
VERT 1" = 8'

CONSTRUCTION NOTES

1. CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVEMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.
2. ABANDON IN PLACE EXISTING 8-INCH WATER. REMOVE AND DISPOSE OF INTERFERING PORTION OF PIPE
3. REMOVE AND DISPOSE OF EXISTING ARV AND BOLLARDS.
4. RECONNECT TO EXISTING SERVICE WATER PER DETAIL X ON SHEET C-50X.
5. PROTECT IN PLACE EXISTING 8-INCH SERVICE LINE.



PLAN

SCALE: 1" = 40'

0 40' 80'

DWG. NO. C-107

CALL 811 AT LEAST TWO DAYS BEFORE YOU DIG		
Know what's below. Call before you dig. UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA		

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 DESIGNED PA
DATE 10/5/22 DRAFTED BY RWR
DATE 10/5/22 CHECKED JJR

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

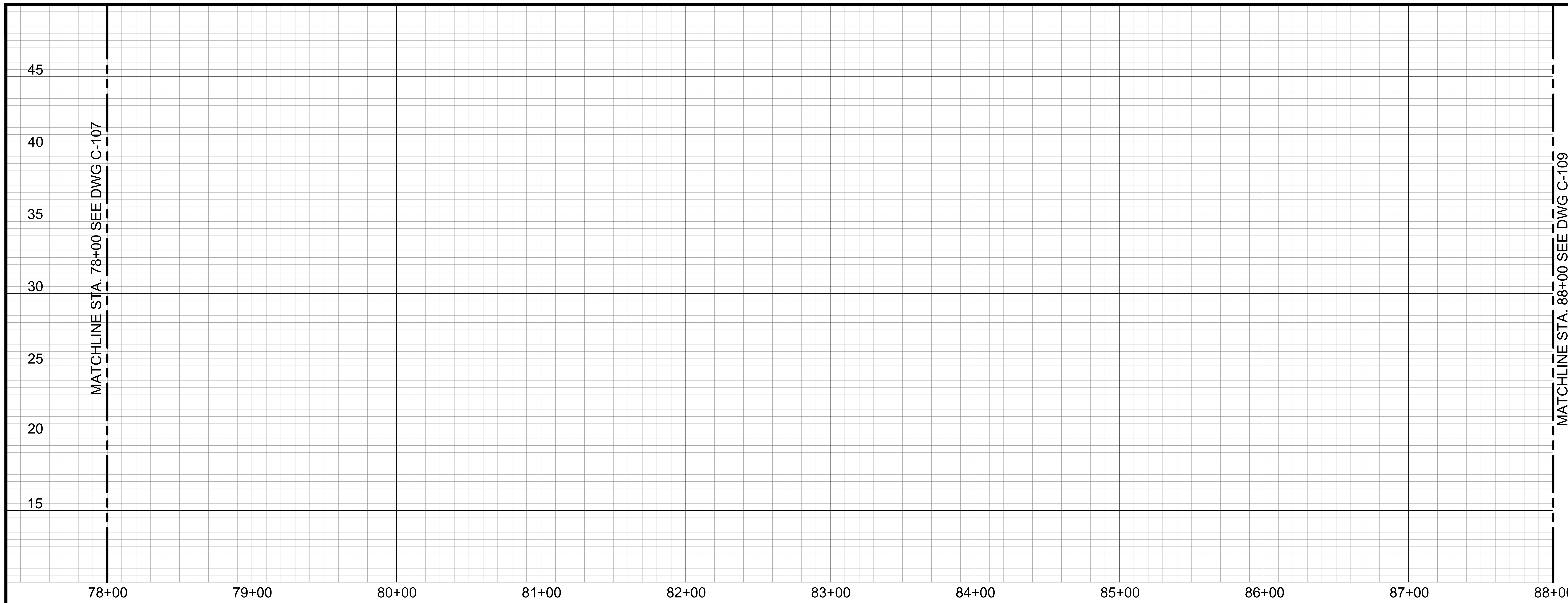
mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 68+00 TO STA. 78+00

SHEET 12 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

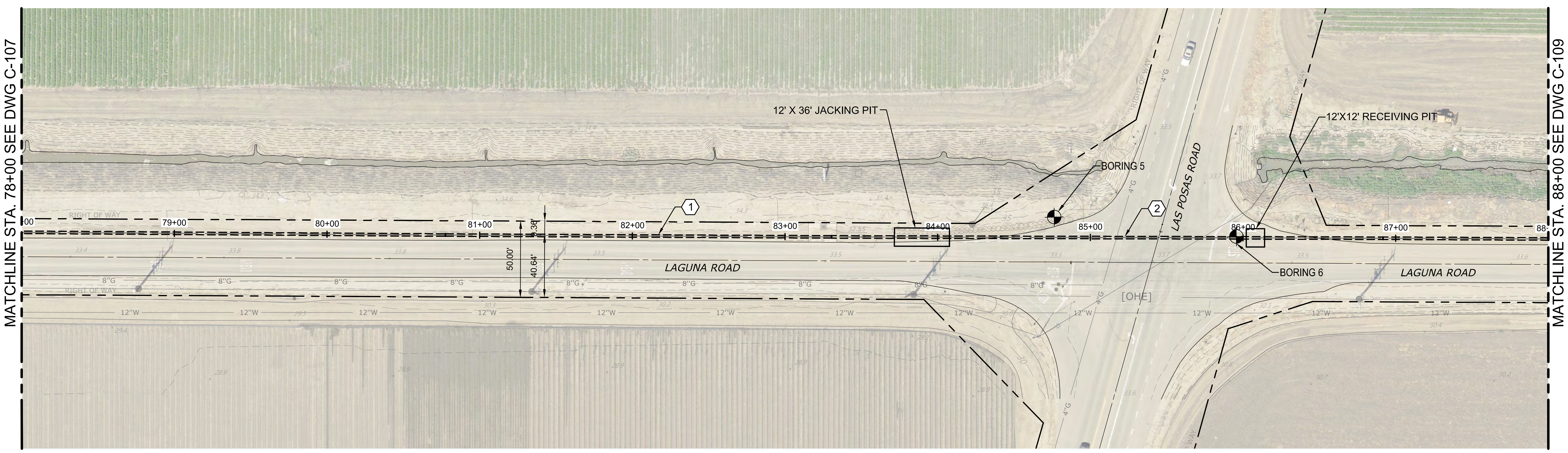


PROFILE

SCALE: HORIZ 1" = 40'
VERT 1" = 8'

CONSTRUCTION NOTES

1. CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVEMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.
2. CONSTRUCT 18-INCH PVC C900/RJ CERTA-LOK PIPE, RESTRAIN ALL JOINTS IN 30-INCH STEEL CASING PER DETAIL X ON SHEET C-50X.



PLAN

SCALE: 1" = 40'

0 40' 80'

DWG. NO. C-108

CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
Know what's **below.** **Call** before you dig.
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA DESIGNED
DATE 10/5/22 RWR DRAFTED BY
DATE 10/5/22 JJR CHECKED

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 78+00 TO STA. 88+00

SHEET 13 OF 15

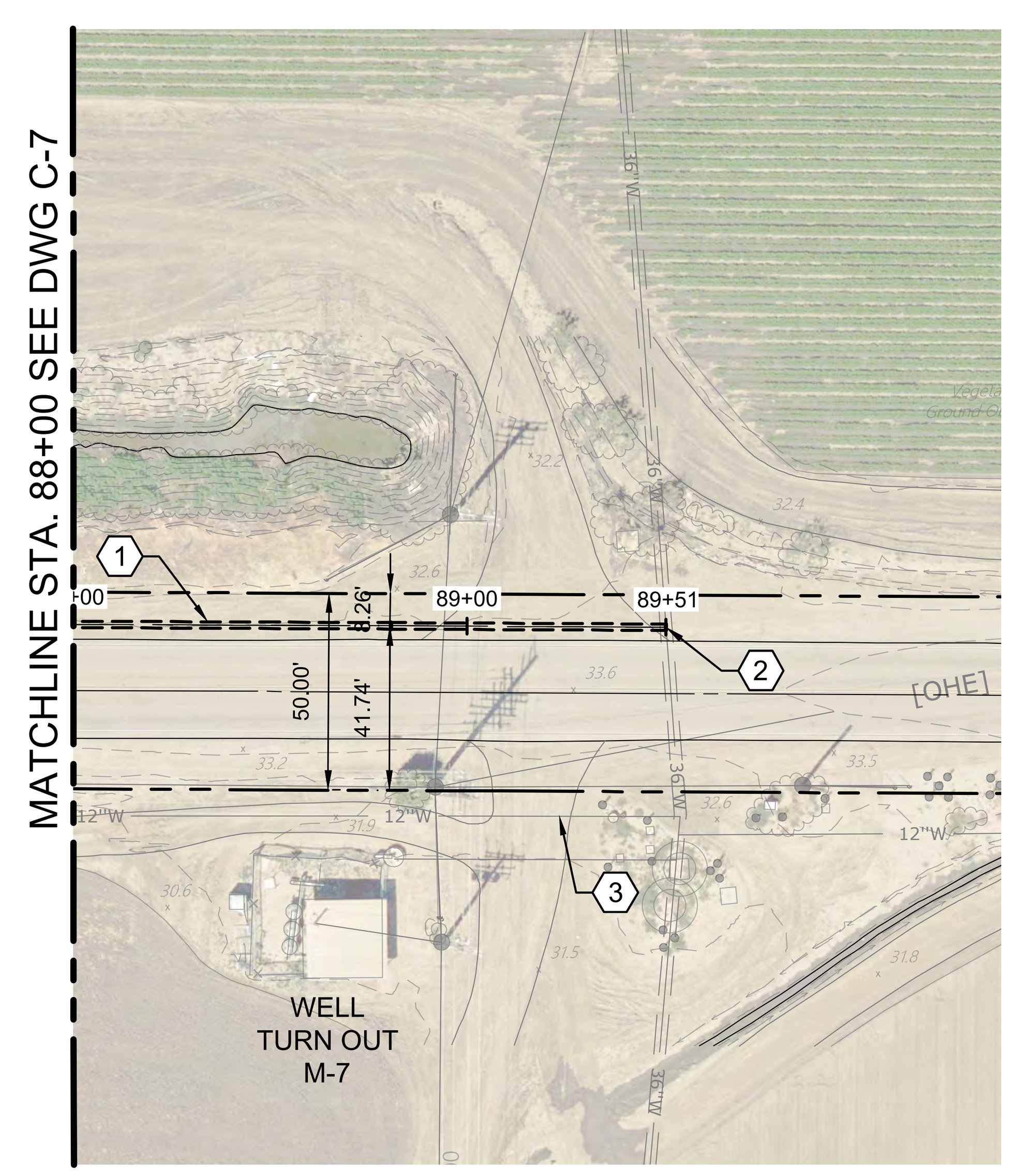
90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

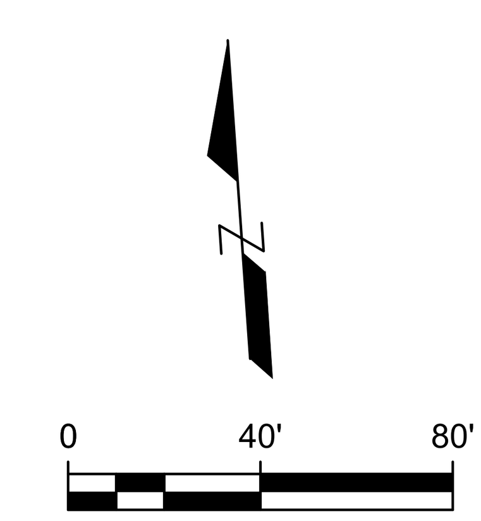
CONSTRUCTION NOTES

1. CONSTRUCT 18-INCH PVC C900 PIPE (DR 21), TRENCH BACKFILL AND PAVMENT REPLACEMENT PER COUNTY OF VENTURA STANDARD PLATE E-11.
2. CONNECT OT EXISITNG 36-INCH PCCP PER DETAIL X ON SHEET C-50X.
3. PROTECT IN PLACE EXISITNG 12-InCH SERVICE LINE.

PROFILE

SCALE: HORIZ 1" = 40'
VERT 1" = 8'





PLAN

SCALE: 1" = 40'

DWG. NO. C-109

CALL 811
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UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA DESIGNED
DATE 10/5/22 RWR DRAFTED BY
DATE 10/5/22 JJR CHECKED

PREPARED BY
RYAN GALLAGHER 10/5/22 Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

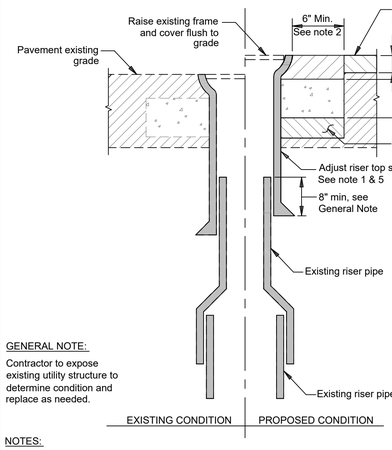
PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
PLAN & PROFILE STA. 88+00 TO STA. 89.51

SHEET 14 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

US UNITS	REVISION:	PLATE E-4a



GENERAL NOTE:

Contractor to expose existing utility structure to determine condition and replace as needed.

NOTES:

1. All necessary portions of the subgrade base and pavement shall be neatly removed. Utility cover shall be raised and the utility riser top sections set to be backfilled to within 1 1/2 inch of the final grade with portland cement concrete. The remaining 1 1/2 inch shall be backfilled with an asphalt concrete wearing surface mixture to match the project surface course. The material shall be placed and compacted in a workmanlike manner to conform to the appearance of the surrounding pavement.
2. Install concrete collar around utility structure, concrete shall be Class 560-C-3250 with maximum 3 inch slump.
3. Asphalt concrete shall be C2-PG 64-10, placed in accordance with Section 302-5.8 of the SSPWC.
4. Backfill compaction shall be a minimum of 95% prior to placing concrete collar.
5. Existing utility installations that do not meet standards must be constructed in compliance with current standard.

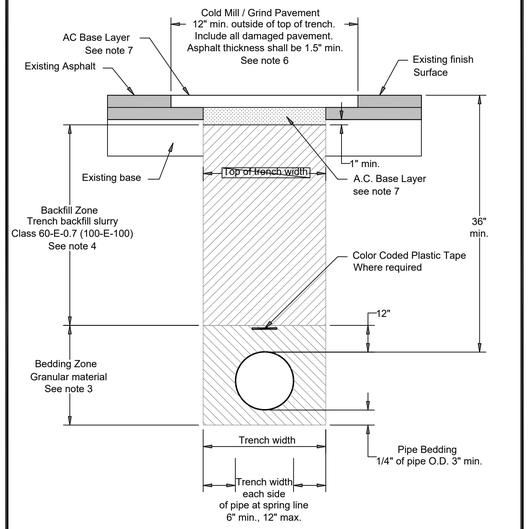
ADOPTED BY BOARD OF SUPERVISORS: 05-16-2017			COUNTY OF VENTURA PUBLIC WORKS AGENCY
REVISION DATE:	DESCRIPTION:	APPROVED BY: J P	ROAD STANDARDS
		RECOMENDED BY: D F	RAISE EXISTING UTILITY COVER

RAISE EXISTING UTILITY COVER

NOT TO SCALE

1

US UNITS	REVISION:	PLATE E-11



ADOPTED BY BOARD OF SUPERVISORS: 05-16-2017			COUNTY OF VENTURA PUBLIC WORKS AGENCY
REVISION DATE:	DESCRIPTION:	APPROVED BY: J P	ROAD STANDARDS
		RECOMENDED BY: D F	PAVEMENT REPAIRS FOR TRENCHING SHEET 1 OF 2

PAVEMENT REPAIRS FOR TRENCHING

NOT TO SCALE

2

US UNITS	REVISION:	PLATE E-11

PLATE E-11 NOTES:

1. Construction shall conform to Standard Specifications for Public Works Construction (SSPWC) except as noted.
2. Trench width shall be as shown unless otherwise shown on the approved plans.
3. Bedding material shall be granular with 100% passing 3/4" sieve, 90 to 100% passing the 3/8" sieve and not more than 4% passing No. 200 sieve.
4. Backfill between the bedding zone and subgrade shall be Trench Backfill Slurry Class 60-E-0.7 (100-E-100). The Director of Public Works may approve the substitution of one of the following:
   a. Controlled Low Strength Material (SSPWC 201-6), provided that the laboratory controls is provided to insure compliance with the specifications.
   b. Non-cementitious backfill, provided that the backfill is tested and certified to meet the approved specifications for the material by an independent testing laboratory (SSPWC 217-2). A Quality Control Plan shall be submitted for approval.
5. Compaction shall not use flooding, ponding or jetting unless directed by Soils Engrineer.
6. A.C. Overlay shall be C1 or C2 PG 64-10, 1.5" minimum.
7. AC Base Layer
   a. Where existing pavements surface is ACtheACBaseLayerthicknessshallbeequaltoor greaterthantheexistingACthicknessplus1"withaminimumof3"andamaximumof8". ForroadswhereTrafficIndexis7.0orgreater(PlatesB-2,B-3&B-7a),theACBaselayer thickness shall be 4" min.
   b. Where existing pavements surface is PCC pavement, sawcut 2" into the existing pavement at the outered geofthetrenchandbreaktheremainingthickness. Replace the PCC and base to the same depth as the existing pavement. The PCC shall be 560-C-3250.

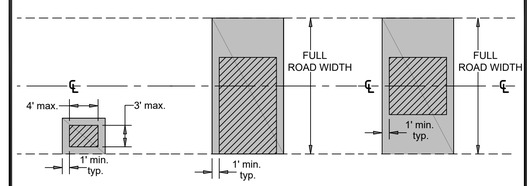
ADOPTED BY BOARD OF SUPERVISORS: 05-16-2017			COUNTY OF VENTURA PUBLIC WORKS AGENCY
REVISION DATE:	DESCRIPTION:	APPROVED BY: J P	ROAD STANDARDS
		RECOMENDED BY: D F	PAVEMENT REPAIRS FOR TRENCHING SHEET 2 OF 2

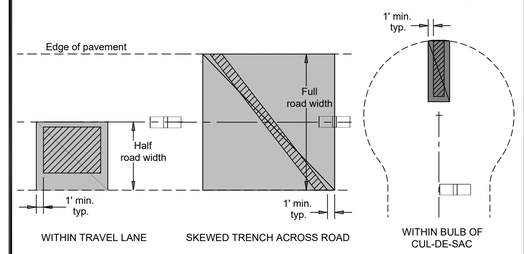
PAVEMENT REPAIRS FOR TRENCHING

NOT TO SCALE

3

US UNITS	REVISION:	PLATE E-12





MORATORIUM ROAD: a county roadway that has received a pavement treatment as follows:
- Greater than one half inch (1/2") in thickness within the last five years
- Half inch (1/2") or less in thickness, within the last 3 years, excluding slurry seal

LEGEND:

Trench Area

Area to be cold milled and paved with 1 1/2" min thickness.

ADOPTED BY BOARD OF SUPERVISORS: 05-16-2017			COUNTY OF VENTURA PUBLIC WORKS AGENCY
REVISION DATE:	DESCRIPTION:	APPROVED BY: J P	ROAD STANDARDS
		RECOMENDED BY: D F	PAVEMENT REPAIR FOR TRENCHING ON MORATORIUM ROADS

PAVEMENT REPAIRS FOR TRENCHING ON MORATORIUM ROADS

NOT TO SCALE

4

DWG. NO. C-110

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UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION OF CHANGE	R.C.E.	DATE	C.T.O.	DATE

DATE 10/5/22 PA DESIGNED
DATE 10/5/22 RWR DRAFTED BY
DATE 10/5/22 JJR CHECKED

PREPARED BY
10/5/22
RYAN GALLAGHER Date

mkn
16310 BAKE PARKWAY
IRVINE, CA 92618 (714) 213-9758

PLEASANT VALLEY COUNTY WATER DISTRICT
APPROVED BY:
Jared L. Bouchard, General Manager DATE

PLEASANT VALLEY COUNTY WATER DISTRICT
RECYCLED WATER PIPELINE
CIVIL DETAILS
SHEET 15 OF 15

90% DESIGN SUBMITTAL–NOT FOR CONSTRUCTION

DWG: N:\Pleasant Valley County Water District\PCWD-2022-002 Pipeline Design\300 Engineering\301 CAD\Plansets\C-10.dwg USER: mobson
DATE: Oct 05, 2022 - 9:54am XREFS: C-BD IMAGES: G-MAIN1.png

Appendix C

Technical Specifications Table of Contents

TECHNICAL SPECIFICATIONS

FOR

Task Order No. 2 – Pipeline Preliminary Design

January 2023

PLEASANT VALLEY COUNTY WATER DISTRICT

154 S Las Posas Road
Camarillo, CA 9301

Approved by:

_____

Jared Bouchard
General Manager
Pleasant Valley County Water District

Prepared by:

_____

Ryan Gallagher, PE
Project Engineer
MKN & ASSOCIATES, INC.

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TASK ORDER NO. 2 – PIPELINE PRELIMINARY DESIGN
TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

400560 Air -Release and Vacuum Relief Valves
400722 Flexible Pipe Couplings and Expansion Joints
402040 Ductile Iron Pipe
402092 PVC Distribution Pipe (AWWA C900)

Appendix D

Geotechnical Investigation
Cotton Shires & Associates

GEOTECHNICAL INVESTIGATION

Pleasant Valley County Water District
24-Inch HDPE Pipeline
Camarillo, California

Prepared for:
Mr. Ryan Gallagher, P.E.
MKN
16310 Blake Parkway
Irvine, California 92618

August 2022

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

330 Village Lane • Los Gatos, California 95030 • (408) 354-5542
Dogtown Road • San Andreas, California 95249 • (209) 736-4252
699 Hampshire Road, Suite 102 • Thousand Oaks, California 91361 • (805) 370-8710

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

August 3, 2022
SC6042

Mr. Ryan Gallagher, P.E.
MKN
16310 Blake Parkway
Irvine, California 92618

SUBJECT: **Geotechnical Investigation**
RE: Pleasant Valley County Water District 24-inch HDPE Pipeline
Camarillo, California

Dear Mr. Gallagher:

Cotton, Shires and Associates, Inc. (CSA) is pleased to submit the following report in which we describe the findings, conclusions, and recommendations of our geotechnical investigation that was conducted for the proposed Pleasant Valley County Water District (PVCWD) 24-inch HDPE Pipeline project along Laguna Road in Camarillo, California. Geotechnical engineering services for this project were provided in accordance with our proposal dated January 7, 2021 February 22, 2022.

In this report, we characterize the geotechnical conditions underlying the subject site and provide geotechnical conclusions and recommendations to aid in the project team's design of the proposed site improvements.

We appreciate the opportunity to have been of service to you on this project. If you have any questions regarding this report, please feel free to contact us.

Sincerely,
COTTON, SHIRES AND ASSOCIATES, INC.

Matthew J. Janousek
Supervising Geotechnical Engineer
PE 73401, GE 3005; exp. 12-31-2022

MJ:MP:st

Mitchel Peace
Staff Engineer

GEOTECHNICAL INVESTIGATION
PLEASANT VALLEY COUTNY WATER DISTRICT
24-INCH HDPE PIPELINE
Camarillo, California

Table of Contents

TABLES **Page**

FIGURES **Figure No.**

APPENDICES **Figure/Table No.**

GEOTECHNICAL INVESTIGATION
PLEASANT VALLEY COUNTY WATER DISTRICT
24-INCH HDPE PIPELINE
Camarillo, California

1.0 INTRODUCTION

In this report we summarize the results of our geotechnical investigation that was conducted for the proposed Pleasant Valley County Water District (PVCWD) 24-inch HDPE Pipeline project along Laguna Road in Camarillo, California. Geotechnical engineering services for this project were provided in accordance with our proposal dated February 22, 2022.

1.1 Project Description

We understand from plans provided by MKN that the project will consist of the construction of an approximate 7,500-foot-long, 24-inch-diameter section of water supply HDPE pipeline to be located along the north side of Laguna Road between Wood Road and Las Posas Road (MKN, 2022). Pipeline invert depths for cut-and-cover portions of the pipeline are expected to vary between approximately 5 and 8 feet below existing grade. The project may also include "trenchless" construction in the area of a north-south trending slough located approximately 2,700 feet east of the intersection of Laguna Road and Wood Road.

Portions of the proposed pipeline are to be built in the area of heavy-traffic-load asphalt pavement areas adjacent to agricultural fields. Additionally, a portion of the proposed pipeline will cross both Wood and Las Posas Roads. As such, part of the project will include replacing the asphalt section that is removed during the excavation and construction of the pipeline.

The general project site location is shown on Figure 1 – Site Vicinity Map. The proposed pipeline alignment with individual boring locations is shown on Figures 2a and 2b – Site Exploration Map. Subsurface conditions at the proposed trenchless crossing below the existing slough are shown on Figure 3 – Engineering Geologic Cross Section A-A'.

1.2 Purpose and Scope of Work

The purpose of the investigation was to: 1) explore and generally characterize the earth materials at the site; 2) identify potential hazards that could impact the proposed construction, including trenchless construction considerations; and 3) to develop suitable geotechnical recommendations and design criteria for the proposed improvements. Our understanding of the proposed project and the general scope of geotechnical services are based on the referenced project plans, and discussions with your office. A summary of the work performed is outlined below.

1.2.1 Research and Review of Available Data – We researched, reviewed, and compiled data from available historic aerial photographs and published and readily available documents, including previous geotechnical investigations on and near the site to gain background data regarding previous site uses and geotechnical conditions.

1.2.2 Subsurface Exploration – Field exploration consisted of advancing six (6) exploratory hollow-stem auger borings on June 21, 2022, to depths ranging from about 11.5 to 26.5 feet bgs, as shown on Figures 3a and 3b. Drilling services were provided by 2R Drilling of Chino, California. Summaries of field exploration procedures and boring logs are presented in Appendix A – Field Exploration.

1.2.3 Geotechnical Laboratory Testing – Laboratory tests were performed on select soil samples obtained from the borings at various sampling depths. Laboratory tests consisted of moisture content, wet and dry unit weight determinations, Atterberg limits, particle size analysis, #200 sieve wash analysis, direct shear strength, Expansion Index, R-value, general corrosion (resistivity, pH, sulfates, and chlorides), and maximum unit weight/optimum moisture content. A summary of the laboratory testing program is presented in Appendix B – Laboratory Testing.

1.2.4 Geotechnical Evaluation and Reporting – Geotechnical evaluation of the subject site consisted of characterizing field and laboratory test data and developing conclusions and recommendations regarding geotechnical and seismic hazards, and pipeline design criteria. Based on data obtained from our subsurface exploration and geotechnical laboratory testing programs, we have provided geotechnical opinions regarding site conditions and geotechnical hazards, and recommendations for the proposed improvements, including:

- Soil and groundwater conditions at the site;
- Site seismicity and liquefaction potential;

- Seismic design parameters based on the 2019 California Building Code;
- Site preparation, grading and compaction requirements for backfill placement in trenches and within other proposed development areas;
- Evaluation of onsite materials for use as compacted fill and backfill;
- Construction considerations including groundwater and subgrade stabilization;
- Trenchless pipeline construction, including jack-and-bore and horizontal/directional drilling considerations;
- Tolerances, shoring, dewatering;
- General corrosion potential of soil encountered (limited soil chemistry testing: pH, resistivity, chloride and sulfate content); and
- Existing and new asphalt concrete pavement areas.

2.0 SITE CONDITIONS

2.1 Surface Conditions

The project site is largely within the shoulder of the north side of Laguna Road. Portions of the project intrude into paved turning lanes and a driveway for an agricultural business located at 645 Laguna Road, and into Las Posas road between the northwest and northeast corners of the intersection of Laguna Road and Las Posas Road. A north-south trending slough crosses beneath Laguna Road to the west of the aforementioned agricultural business. An east-west trending slough runs adjacent to the north side of the Laguna Road shoulder between Las Posas Road and the aforementioned north-south trending slough. The sloughs are currently up to about 10 feet deep relative to the adjacent elevations with slopes generally about 1:1 (vertical:horizontal). Properties adjacent to the project site are comprised primarily of agricultural fields. The area of the proposed pipeline is essentially flat with a very gentle slope towards the west for a total of about 8 feet of elevation difference between the easternmost extent of the project (elevation +33 feet) and westernmost extents of the project (elevation +27 feet).

2.2 Geologic Setting

The subject site is located on the eastern portion of the Oxnard Plain, which lies in the western part of the Transverse Range geomorphic province of California. The Transverse Range geomorphic province is an east-west trending province that extends westward from the eastern margin of the San Bernardino Mountains to Point Arguello on the California coast and the Channel Islands off the coast in the Santa Barbara Channel. The Oxnard Plain is part of the larger

portion of the Transverse Range known as the Ventura and Soledad Basins. The Soledad Basin lies to the east of the San Gabriel fault and separates the two basins.

Surficial geology at the subject site consists of recent Holocene-age wash and alluvial deposits (Qhw2, Qhf and Qha3), as shown on Figure 4 – Regional Geologic Map. Alluvial deposits encountered below the surficial fill across the site during subsurface exploration are consistent with mapped conditions.

2.3 Subsurface Conditions

Overall, our recent exploration data correlates well with historical exploration data. Three primary stratigraphic units were interpreted from the borings, consisting of: 1) artificial fill and mixed surficial materials; 2) fine-grained alluvium consisting of clay and silt with varying amounts of sand and occasional silty sand lenses; and 3) coarse-grained alluvium consisting of silty and clayey sand.

2.3.1 Artificial Fill – Artificial fill (af) was generally encountered in the upper 1 to 3.5 feet of the borings and consists of gravelly, silty sand and silty clay. The fills appear to be in support of Laguna Road.

2.3.2 Alluvium – Fine- and coarse-grained alluvium was encountered in the borings below the artificial fill and to the maximum depth explored of about 26.5 feet bgs.

Fine-Grained Alluvium. Fine-grained alluvium generally consisted of soft to medium stiff lean clays and silts with varying amounts of sand, and often with calcareous deposits. Field blow counts in these fine-grained layers ranged from 4 to 31 blows per foot (bpf). Dry unit weights on samples of the lean clay alluvium ranged from about 85 to 108 pounds per cubic foot (pcf), with moisture contents between about 14 and 37 percent.

Coarse-Grained Alluvium. Coarse-grained alluvium generally consisted of loose to medium dense silty and clayey sand. Field blow counts in these coarse-grained layers ranged from 5 to 46 blows per foot (bpf). Dry unit weights on samples of sandy alluvium ranged from about 89 to 115 pcf, with moisture contents between about 15 and 24 percent.

2.3.3 Groundwater Conditions – Groundwater was encountered in four borings performed for this study. Table 1 presents the approximate stabilized groundwater depths and corresponding elevations measured in the during the field exploration program. Measured groundwater depths presented in Table 1 may reflect perched groundwater levels, and may not

represent static groundwater levels. Fluctuations in groundwater levels may occur from variations in rainfall, flooding and other factors, and groundwater levels may be different at different times and locations.

Table 1. Summary of Measured Groundwater Levels

CSA Boring No.	Measurement Method	Stabilized Groundwater Depth (feet)	Stabilized Groundwater Elevation (feet)	Measurement Date
B-1	Measuring Tape	4.0	23	6/21/2022
B-2	Measuring Tape	18.5	8.5	6/21/2022
B-3	Measuring Tape	23.0	5.0	6/21/2022
B-4	Measuring Tape	11.0	18.5	6/21/2022

We note that elevated moisture levels, including very moist to wet conditions, were observed and measured in the alluvial deposits encountered above the stabilized groundwater levels listed in Table 1, as indicated on the respective boring logs. In addition, data published by CDMG (2002) indicate a historical high groundwater level of about 5 to 7 feet below bgs across the subject site. Very moist to wet conditions should be anticipated in excavations conducted for both the shallow cut-and-cover and deeper slough undercrossing portions of the pipeline.

3.0 SEISMICITY

The seismicity evaluation for the project consisted of the assessment of earthquake hazards such as seismic setting and nearby faults, CBC seismic design criteria and estimated strong ground motion, as summarized below.

3.1 Seismic Setting and Nearby Fault Sources

The Oxnard coastal plain is located in a very seismically active area. Historically, this area has been subjected to strong seismic ground shaking from major earthquakes and will continue to experience strong ground shaking in the future. Table 2 presents a summary of the distances to the project site and the maximum magnitude of selected nearby fault sources that may cause

future ground shaking at the project site. The Camarillo Fault, which is likely part of the Simi-Santa Rosa-Springville fault system, is the closest active fault to the site (about 1,000 feet to the north) and it is zoned within an Alquist-Priolo Earthquake Fault Zone (APEFZ). However, the subject property is not within the APEFZ, and the Camarillo Fault is not considered a critical, contributory fault for seismic design purposes.

Table 2. Summary of Nearby Fault Sources

Fault Name	Distance Between Site and Surface Projection of Earthquake Rupture Area (mi)	Estimated Maximum Earthquake
Simi-Santa Rosa	3.32	6.95
Oak Ridge Onshore (blind)	6.76	7.54
Ventura-Pitas Point	8.88	7.46
Oak Ridge Offshore	9.97	6.90
Malibu Coast	7.04	7.64
San Andreas	45	7.80

3.2 2019 California Building Code Seismic Design Criteria

Based on our geotechnical investigation, the site location (latitude N 34.1761° and longitude W 119.0837°) and our interpretation of the 2019 CBC documents related to Earthquake Loads (Section 1613), Table 3 provides the following parameter recommendations from the corresponding figures and tables. Complete summaries of seismic parameters are presented in Appendix C.

Table 3. 2019 CBC Seismic Design Criteria

Parameter	Referenced Table/Figure/Eqn.	Value
Site Classification	1613.5.2	D
Mapped Spectral Acc. 0.2 Sec. (g)	1613.5(3)	S_S= 1.582
Mapped Spectral Acc. 1 Sec. (g)	1613.5(4)	S_1 = 0.583
F_a - Site Coefficient	1613.5.3(1)	1.2
F_v - Site Coefficient	1613.5.3(2)	null
$S_{MS} = F_a*S_s$	16-37	1.899
$S_{M1} = F_v*S_1$	16-38	null
$S_{DS} = 2/3*S_{MS}$	16-39	1.266
$S_{D1} = 2/3*S_{M1}$	16-40	null

3.3 Peak Ground Acceleration

We performed a probabilistic seismic hazard analysis for the site using the USGS Unified Hazard Tool with ASCE 7 (with 2016 errata). Taking into account the faults described above, the 2019 California Building Code (CBC), the ASCE 7-16 code coefficients presented in Section 3.2, the results of the peak ground acceleration, and a return period of 2,475 years (i.e., 2% probability of being exceeded in 50 years), it is our opinion that the proposed improvements could experience a Maximum Considered Earthquake Geometric Mean (MCE_G) Peak Ground Acceleration (PGA_M) as high as 0.74g, with a corresponding estimated earthquake mean magnitude of 6.95.

4.0 SEISMIC GEOHAZARDS

In the following sections, we discuss potential seismic geohazards that may impact the subject site along with the corresponding degrees of estimated potential risk.

4.1 Ground Rupture Potential

The subject site is not located within a designated Alquist-Priolo Earthquake Hazard Zone (CGS, 1998). Active or potentially active faults are not known to exist on or trend toward the site. As such, the potential for primary ground surface rupture due to faulting is considered low.

4.2 Tsunami and Seiche Hazard

Based on the general site elevation (+27 to +33 feet) and distance to the Pacific Ocean (about 5 miles), potential impacts from tsunami hazard appear to be very low. Considering the absence of any large body of water in the vicinity of the subject site, we assume that the potential for earthquake-induced seiche effects to adversely impact the subject site is low.

4.3 Liquefaction Potential and Related Settlement

Liquefaction occurs when saturated, loose to medium dense, sands and low-plasticity silts and clays are subjected to seismically-induced strong shaking. Liquefiable soils typically lose a portion or all of their shear strength and regain strength sometime after the shaking stops. Soil movements, both vertical and lateral, can occur as a result of liquefaction and ground shaking.

The site is located within a Liquefaction Hazard Zone as mapped by the State of California (CGS, 2002) under the Seismic Hazards Mapping Act of 1990. Loose to medium dense sands are present beneath the subject site, and static groundwater levels have been documented within 5 feet of the ground surface. There is a potential for liquefaction to impact portions of the subject site; however, evaluation of the magnitude and lateral extent of estimated liquefaction-related settlement is beyond the scope of this pipeline project.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations for site grading and foundation design, as presented below, are based on our subsurface explorations for the subject site performed in June 2022, and limited laboratory testing. Recommendations presented below should be incorporated into the project plans and specifications and should be adhered to during construction. Prior to contract bidding, site grading and construction plans should be reviewed by **Cotton, Shires & Associates** for consistency with our recommendations.

5.1 Cut-and-Cover Trenching

5.1.1 Site Preparation – Prior to commencing grading operations, soil materials containing debris, organics, pavement, or other unsuitable materials should be stripped from the improvement areas. Demolition of on-grade improvements should include removal of pavements, slabs, abandoned utilities, and soils disturbed during the demolition process. Depressions or disturbed areas left from the removal of such material should be replaced with compacted fill.

5.1.2 Excavation Considerations – Based on the drilling effort expended during subsurface exploration, we anticipate that excavation of earth materials can be performed using conventional earth excavation equipment. However, wet saturated soil conditions were encountered at depths as shallow as 4 feet. We recommend that heavy equipment loads be reduced as much as practical in areas where the subgrade soils are well over optimum moisture content to reduce the potential need for subgrade stabilization of the excavation bottoms. Heavy equipment loads and traffic (i.e., number of passes) could further elevate moisture contents, thereby making it difficult to obtain the minimum compaction requirements as the soil becomes too wet.

5.1.3 Temporary Excavations – Unshored temporary excavations, without seepage our groundwater, should not exceed a vertical height of 5 feet. Sloped excavations may be used as temporary access in areas with enough room to accommodate the slopes. Temporary excavations should be monitored continuously by the contractor. Loose or unstable soil should be removed immediately. Temporary slopes and excavations should conform to Federal Occupational Safety and Health Administration (OSHA) and/or California Division of Occupational Safety and Health (DOSH) regulations and other applicable local ordinances and building codes, as required. However, the contractor should be made responsible for all safety issues regarding open excavations.

5.1.4 Trench Excavation Bottoms – Trench excavation bottoms should be cut neat, relatively smooth, and free of standing water and soft, loose, or disturbed soils. CSA staff should observe and approve excavated bottoms prior to the placement of bedding materials.

Additionally, due to the possibility of encountering seepage or groundwater within the excavations, excavation bottoms may be locally wet, soft, and yielding. For those conditions, the trench excavation bottom should be stabilized prior to placement of bedding and fill materials in accordance with the recommendations presented subsequently in Section 5.1.5.

5.1.5 Special Subgrade Stabilization Measures – Yielding or pumping subgrades may develop depending on material type, moisture content, applied equipment, and proximity to groundwater. Pumping subgrade conditions can range in severity and often require a trial-and-error procedure to determine the appropriate remedial method. Special stabilization measures may be required to provide a firm and unyielding subgrade surface if soft or pumping subgrade is encountered or created during grading activities. Special subgrade stabilization measures that have been successfully used on other projects consist of:

- Placing a 1- to 2-foot-thick layer of 3- to 4-inch rock on the excavation bottom;
- Placing a 1- to 2-foot-thick layer of ½-inch to ¾-inch clean crushed drain rock sandwiched by two layers of filter fabric;
- Use of a geosynthetic placed beneath a minimum 1-foot lift of gravel or rock or gravel fill; and/or
- Mixing cement or lime into the fine-grained subgrade (as described in Section 5.1.6).

Whether these measures are required will depend on the condition of the subgrade at the time of construction, the moisture content of the subgrade materials, and the nature of the construction activities (e.g., earthmoving equipment type and loading, number of equipment passes, etc.).

5.1.6 Cement- or Lime-Treated Stabilization – An alternative to use of rock or gravel for excavation bottom stabilization is the treatment of onsite wet clay materials with cement or lime to reduce elevated in-place moisture content and, for the cement option, to effect "bridging" over yielding, unstable excavation bottoms. For clayey subgrade treatment, we estimate that 4 to 6 percent "quicklime" or 6 to 8 percent cement (by weight) should be thoroughly mixed into the upper 18 inches of the excavation bottom. Generally, cement affects bridging over yielding wet excavation bottoms more reliably than lime.

For the cement option, cement should be thoroughly mixed into the upper 18 inches of the excavation bottom in accordance with Sections 301-3.1 through 301-3.1.6 of the "Greenbook." A "mellowing" period of 16 to 48 hours is required before compacting. After "mellowing," the soil-cement mixture should be moisture-conditioned and compacted according to Section 301-3.1.8. The compacted soil-cement mixture should be cured according to Section 301-3.1.9. At least 2 days of curing time should be allowed, prior to placement of general, select, or treated fill materials.

If mitigation with lime is selected to address pumping subgrade and/or high moisture content fill material, we estimate that 4 to 6 percent high calcium or dolomitic quicklime (by in-situ unit weight) should be thoroughly mixed into the upper 18 inches of the excavation bottom and fill material.

The lime treatment operation should be conducted in general accordance with Section 24 of the Caltrans Standard Specifications (2018). Lime-treatment typically consists of spreading the required amount of lime over the area to be treated, followed by initial mixing of the lime and adding water (as necessary) within the soil section to be treated. This initial mixing is then allowed to sit for a period of about 24 hours or longer to permit the resulting chemical reaction to break down the material and change it chemically. Following this “mellowing” period, the soil-lime section is re-mixed and additional water, if needed, is added. It is important that adequate water be added during final mixing to ensure complete hydration of the lime and to bring the soil moisture content to at least 3 percent above the optimum moisture content before compaction takes place.

After the lime-treated pad/subgrade is compacted, it should be allowed to harden (cure) before construction equipment can operate on it without rutting the surface. Throughout this curing period, the surface of the lime-treated soil should be kept moist to aid in strength gain. It is very important that the general steps outlined above be performed in a manner that introduces sufficient water to the soil-lime mix to allow the lime to thoroughly hydrate and react chemically with the soil subgrade. Likewise, it is equally important that proper curing of the lime-treated section take place.

5.1.7 Pipe Zone Materials – Pipe zone materials are herein defined as those select earth materials used as pipeline bedding and shading, and as structure bedding, to facilitate placement and achieve unform support of the pipeline. Pipe zone materials should consist of gravel or clean sand. Gravel should conform to the gradation for 3/4-inch, crushed rock per Table 200-1.2.1, of the Greenbook (2021). Clean sand should have a minimum sand equivalent of 30. Pipe zone materials should extend from a minimum of 6 inches below to 12 inches above the pipe for the full trench width. Pipe zone materials should be properly placed in loose lifts no greater than 6 inches thick and mechanically compacted to achieve a minimum of 90 percent relative compaction as determined by ASTM D1557. Jetting or flooding of the of pipe zone materials should not be allowed.

Based on our observations and laboratory test results, the soils encountered during our subsurface exploration for the project appear unlikely to comply with the recommendations presented above for pipe zone backfill materials. Therefore, pipe zone backfill materials will need to be imported to the project site.

5.1.8 Trench Backfill Materials and Compaction – Trench backfill materials are defined herein as those materials placed above the pipe zone. On-site materials may be used as trench backfill provided that the materials are free of excessive moisture, deleterious materials, organics, and oversize materials (cobbles) greater than 3 inches in maximum dimension. Based on our observations and laboratory test results, artificial fill and alluvial soils encountered consist predominantly of low expansion clays and silts with few silty and clayey sands that may be reused as compacted fill. As a result of the high moisture content the onsite clayey materials and the possibility of encountering relatively shallow or perched groundwater, we suggest that onsite excavated clay soils be spread thinly to aerate prior to being placed as fill. Similarly, excavation bottoms should be anticipated, at a minimum, to require extended aeration periods prior to compacting. Alternatively, high moisture content excavated soils can also be treated with cement or lime, as discussed above.

Trench backfill should be spread in loose lifts no greater than 8 inches thick, moisture conditioned to within 3 percent above optimum moisture, and mechanically compacted to at least 90 percent of the maximum dry unit weight as determined by ASTM D1557. The upper 1 foot of subgrade below paved areas should be compacted to at least 95 percent of the maximum dry unit weight as determined by ASTM D1557.

5.1.9 Filter Between Pipe Zone and Gravel Backfill Materials – If gravel material is used for pipe zone backfill, there is a potential for soil particles to migrate into the interstices of the crushed rock. Should this occur, settlement of the ground surface is possible. Migration of finer particles may occur from seeping groundwater or possibly traffic vibrations. We anticipate that a majority of the migration would result from vertical (downward) migration of trench backfill materials into the gravel pipe zone backfill.

There are several possible mitigations to reduce the amount of soil migration into the gravel pipe zone backfill in areas where ground surface settlement would be problematic (e.g., roadways, areas sensitive to surface drainage characteristics). Where this is a concern, we recommend that a layer of filter fabric be placed on top of the gravel prior to the placement of trench backfill. Where additional migration is necessary, the gravel pipe zone backfill should be fully encapsulated in filter fabric.

5.1.10 External Pipeline Loads – External loads on the pipes will include loads due to the overlying earth materials, loads due to construction activities, and traffic loads. Pipes should be designed to resist the imposed loads with an acceptable factor of safety and an acceptable amount of deflection as recommended by the manufacturer.

Loads on the pipe due to the overlying soil will be dependent upon the depth of placement, the type and method of backfill, the type of pipe, the configuration of the trench, and whether or not any fill will be placed above the ground surface. “Trench conditions" may occur along the pipe route. Trench conditions are defined as those in which the pipe is installed in a relatively narrow trench, cut in undisturbed ground, and covered with earth backfill to the original ground surface. To estimate vertical loads on pipes, the unit total weight of the backfill materials may be assumed to be 120 pcf. The pipe may be subject to surcharge pressures due to construction activities and traffic. Those surcharge pressures should be considered in the design of the pipe.

5.1.11 Modulus of Subgrade Reaction – Flexible and semi-rigid pipes are typically designed to withstand a certain amount of deflection from the applied earth loads. To estimate deflection, a modulus of soil reaction of 500 psi may be assumed for the backfill soil types and recommended bedding materials anticipated along the pipe alignment.

5.2 Jack-and-Bore Construction

5.2.1 General – We understand that jack-and-bore methods may be used to construct the pipeline below the existing slough, as shown on Figures 2 and 3. For the purposes of this report, jacking and boring refers to simultaneously jacking a pipe through the soil while removing the soil inside the pipe using a rotating auger or cutting head. Generally, pipe sections are advanced horizontally from a jacking pit that is excavated to a depth corresponding approximately to the pipe invert elevation. The pipe sections are advanced until interception at the pre-constructed receiving pit.

Jack-and-bore techniques are best suited for firm, dry ground that is relatively free of rock or large obstructions such as gravel, cobbles, or boulders. Special techniques incorporating differing boring heads and jacking procedures may be used to install pipe through less-than-ideal subsurface conditions. Due to the presence of groundwater and seepage, and varying soil types at this site, such techniques could include the use of a face shield to facilitate the boring operations and maintain the correct alignment. An experienced drilling contractor familiar with trenchless pipeline construction, particularly at sites with high groundwater and a mixture of fine and coarse grained alluvial soils, should be provided this report and consulted with to develop a sound approach to achieve the proposed constructions.

Based on our observations during drilling, we anticipate that conventional heavy grading equipment, in good working order, should be capable of excavating the earth materials encountered at the proposed jacking pit and receiving pit areas.

Soils in the jacking entry and receiving pit areas consist of fine-grained clay and silt soils that range in consistency from soft to medium stiff. There also are occasional layers of loose to medium dense silty and clayey sand interbedded within those upper fine-grained materials. The range of cohesive soil consistency could make selection of a micro-tunneling machine challenging. If possible, the tunneling operation should be performed during the summer months when groundwater levels may be lower and groundwater flow reduced.

Jack-and-bore equipment is typically selected based on a single type of ground condition. The geotechnical conditions at the trenchless installation location should be reviewed when selecting boring, tunneling, and drilling equipment. A combination of equipment may be needed.

5.2.2 Line and Grade Tolerance – Typical vertical and horizontal tolerances for jacking and boring are 1 percent of the length of the bore. Lesser tolerances require closer monitoring of the operation during advancement of the bore. Monitoring consists of periodically removing the auger from the bore, surveying the alignment of the pipe or casing, and then making necessary changes to the jacking pressures to adjust the advancement of the bore. Alternatively, tunneling machines provide closer tolerances than conventional jack-and-bore construction, but at greater expense. Frequent monitoring and adjustments can slow the progress of the jacking and boring operation. Monitoring and adjustments to the jacking and boring operation will likely be needed to maintain the alignment of the pipeline during the advancement of the bore.

5.2.3 Jacking and Receiving Pits – The jacking and receiving pit bottoms should be excavated to at least an elevation of roughly 2 to 3 feet below the invert elevation of the casing, which corresponds to elevation 12 feet or lower. This is approximately 15 feet or more below the existing adjacent ground surface.

We anticipate that the jacking and receiving pit excavations will be shored. Excavations should be within the capabilities of standard excavation equipment (i.e., backhoes and excavators). Even though stabilized groundwater was measured below the bottom of the slough at the time of exploration (June, 2022), the contractor should anticipate very moist to wet conditions above the stabilized groundwater levels. Dewatering will likely be necessary during the excavation of the pits and likely throughout the boring and jacking operation.

The following soil parameters are provided for consideration in the design of the temporary pit excavation shoring; however, the shoring designer is ultimately responsible for choosing appropriate parameters and designing suitable shoring.

Retained Material – In designing the shoring for the jacking and receiving pits, we recommend that the following soil parameters be used to calculate the active/at rest pressures of the retained material:

Total Unit Weight (g)	120 pcf
Cohesion (c)	250 psf

Friction Angle (ϕ) ..... 21 degrees

None of the above values have been reduced or include a factor of safety.

Resisting Material (Passive Pressures) – In designing the shoring for the jacking and receiving pits, we recommend that the following equivalent fluid passive pressures be used:

In upper 2 feet of the excavation/pit bottom ..... 0 pcf
Below 2 feet of the excavation/pit bottom (factor of safety = 1.5) ..... 300 pcf

Surcharge Loading – Shoring should also be designed to support surcharge loads, where applicable, including the following:

Construction Vehicles (within a 1:1.5 slope of the pit bottom) ..... 250 psf
Stockpiled Soil (within a 1:1.5 slope of the pit bottom) ..... 100 pcf

(multiplied by the height of the stockpile in feet)

Excavations should be conducted within the capabilities of standard excavation equipment (i.e., backhoes and excavators); however, we do not recommend the use of heavy equipment in wet or saturated areas, as described in Section 5.1.2 this report. We recommend applying OSHA soil parameters in accordance with Soil Type C for excavations made through site artificial fill and alluvial soils.

Dewatering – Stabilized groundwater levels were measured at depths ranging from 18.5 to 23 feet in Borings B-2 and B-3, respectively. However, wet soils were encountered above the stabilized groundwater and likely within the jack-and-bore excavation limits. Dewatering systems, where required, should be designed, installed, and operated by an experienced contractor specializing in groundwater dewatering systems. Before implementing a dewatering system, we recommend that the contractor conduct a dewatering test program to evaluate the feasibility and efficiency of the proposed dewatering system. Dewatering efforts should endeavor to maintain water levels at least 3 feet below the base of jacking pits and should result in excavation sidewalls free of groundwater seepage.

5.3 Horizontal/Directional Drilling

5.3.1 General – Horizontal or directional drilling generally consists of three phases:

1. Drilling a pilot hole between two points around, beneath or beyond an obstacle (such as the north-south trending slough at this project located between Borings B-2 and B-3;
2. Reaming or overdrilling the pilot hole to a diameter that is large enough to accept the pipe proposed for the project; and
3. Pulling the pipe into place within the reamed or overdrilled pilot hole.

Care should be taken as not to overcut the drilled pilot hole, as the difference between the diameter of the drilled hole and the pipeline/casing can result in settlement along the pipeline alignment. As such, the annular space between the drilled hole and the pipeline/casing should be grouted.

Drilling angles between 10 and 20 degrees are routinely used as the drill string penetrates the ground at the prescribed entry point. The type of drill pipe or pipe being installed limits the radius, or curvature of the bore. In general, the minimum radius of the bore can be estimated as being 100 times the diameter of the pipe being installed (assuming steel) or the drill pipe, whichever is larger (DCCA, 1998).

Drilling fluid or drilling mud is used during directional drilling operations to help advance the drill string, support the drill hole , and remove the drill cuttings. Typically, the mud is mixed on the surface, pumped through the drill string, and circulated through the drill hole back to the surface. The mud is typically a mixture of water and bentonite.

Directional drilling is best suited for firm ground. Although significant amounts of gravel, cobbles or rock are not expected to be encountered during construction, drilling may be advanced through gravel, cobbles or rock (if encountered) with increased drilling times and tolerances may be more difficult to maintain. Drilling times and costs can also be increased due to lost circulation of the drilling mud, an event where mud is diverted along a flow path other than annular space leading back to the pump. Lost circulation may occur when drilling through coarse and permeable soils lacking a soil matrix, fractured rock, and cavernous formations. Pre-grouting or cementing the formation in advance of drilling can be used to assist with the drilling.

5.3.2 Tolerances – Tolerances for directional drilling operations can typically be less than 1 percent of the length of the trenchless installation. Monitoring can be accomplished using walkover or wireline systems. The ability to monitor the location of the heading is typically more precise than the ability to steer it. With a walkover system, the drill string is located and guided using a transmitter housed behind the drill bit that sends signals to a remote receiver located at the ground surface. With a wireline system, the drill string is located and guided using a wire running through the drill pipe that is connected toa a computer guidance system. Closer tolerances, to about 0.1 percent of the reach can be achieved during directional drilling generally using these more sophisticated techniques.

5.4 General Corrosivity Considerations

A bulk sample of the near-surface soil obtained from Boring B-5 was tested for resistivity, pH sulfates, and chlorides. The results are presented in Table 4.

Table 4. Summary of Corrosivity Test Results

Boring/Sample Depth	Soil Description	Resistivity (ohm)	pH	Sulfates (%)	Chlorides (%)
B-5 @ 2-7 feet	CL	440	7.23	0.042	0.023

The resistivity values presented above suggest that onsite soil materials are severely corrosive to underground steel. Tests results for sulfates indicate that onsite soils may be classified as S0 per ACI 318 Table 19.3.1.1. On the basis of sulfate concentration, we recommend that Type II cement be used for concrete in contact with earth materials, in accordance with CBC Chapter 19A (2019).

CSA does not practice in the field of corrosion engineering and the test results presented herein are preliminary. Test results should be evaluated by a corrosion engineer to assess how concrete structures and underground utilities should be protected from anticipated subsurface materials.

5.5 Replacement of Existing Asphalt Concrete Pavement

At a minimum, we recommend that existing asphalt concrete pavement sections be replaced with an equal thickness as asphalt concrete, plus 1 inch. Granular base materials should be replaced with an equal thickness of Caltrans Class II base, Crushed Aggregate Base, or Processed Miscellaneous Base in accordance with the Greenbook (2021). Table 5 below presents

a summary of existing pavement sections at the boring locations, which were recorded during our field exploration.

Table 5. Summary of Existing Pavement Sections

CSA Boring No.	Asphalt Concrete Thickness (in.)	Aggregate Base Thickness (in.)	Total Pavement Section Thickness (in.)
B-4	6.0	4	10.5
B-6	4.5	4	8.5

5.6 New Asphalt Concrete Pavement

Some unpaved areas of the proposed project may be improved with new flexible pavement sections consisting of asphaltic concrete and aggregate base, which should be designed using methods by Ventura County (2020). A measured R-value for a sample of the onsite clayey subgrade was 20. A Traffic Index (TI) range of 5 to 7 was used for areas to receive low volume truck traffic. TI values do not include any construction traffic after the pavement is placed. If design TI values are different from the assumed values, CSA should be notified accordingly for reevaluation of pavement section thickness.

Recommended minimum flexible pavement sections, comprising asphaltic concrete over aggregate base, for the assumed TI range and design R-value of 20, are presented in Table 6.

Table 6. Summary of Minimum Flexible Pavement Sections

Traffic Index	Asphalt Thickness (in)	Aggregate Base Thickness (in)
5	3	7.5
6	3.5	9.5
7	4.0	12.0

5.6.1 Pavement Construction Considerations

Subgrade. Soils within all pavement areas should be overexcavated to a depth of about 1 feet below existing grade or at least 1 foot below aggregate base layer, whichever is deeper. Following observation of the excavation bottom by CSA, the exposed surface should be scarified 8 inches, moisture-conditioned to within 3 percent above optimum moisture content, and compacted to a minimum of 90 percent of the maximum unit weight determined from ASTM

D1557. The upper 12 inches of pavement subgrade should be compacted to a minimum of 95 percent of maximum dry unit weight as determined by ASTM D1557.

Aggregate Base. Aggregate base material should be compacted, in lifts not exceeding 6 to 8 inches in thickness, to at least 95 percent of the maximum dry unit weight determined by ASTM D1557. As-compacted moisture contents for aggregate base materials should be within 2 percent of the optimum moisture, as determined from ASTM D1557.

Drainage. Proper drainage of the paved and surrounding unpaved areas is essential. Grades should be established to expedite runoff away from pavements and reduce moisture infiltration into the base and subgrade.

6.0 INVESTIGATION LIMITATIONS

Our services consist of professional opinions and recommendations made in accordance with generally accepted engineering geology and geotechnical engineering principles and practices. No warranty, express or implied, or merchantability or fitness, is made or intended in connection with our work, by the proposal for consulting or other services, or by the furnishing of oral or written reports or findings.

This report has been prepared for the exclusive use of MKN, Pleasant Valley County Water District, and their authorized agents for design considerations for the proposed 24-inch HDPE pipeline project in Camarillo, California. This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are called to the attention of the project architect and/or engineer and incorporated into the design plans, as appropriate.

7.0 REFERENCES

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FIGURES

COTTON, SHIRES AND ASSOCIATES, INC.

LOG OF EXPLORATORY DRILLING

Project: PVCWD 24-Inch HDPE Pipeline **Logged By:** MiP **Project No.:** SC6042 **Boring:** B-1
Location: Station 12+40 **Elevation (ft.):** 27.0 **Weather:** Hazy/Warm
Drilling Contractor/Rig: R2/ Truck Mounted GT-16 **Drill Date:** 6/21/2022 **Hole Diameter (in):** 8

Elevation (feet)	Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig.	Dry Unit Weight (pcf)	Moisture Content (%)	Field Blow Count	Sample Type	Remarks
	0		ML	Artificial Fill: Sandy silt w/ gravel (ML); light brown, moist, medium stiff, fine to medium sand, fine gravel						Bulk: 1'-5' Fines: 51.7% Moisture: 21.3%
	1									
	2		MH	Alluvium: Silt with sand (MH); dark brown, moist, medium stiff, intermittent fine to medium silty sand, scattered calcareous deposits, elastic						
	3									
	4				R1	85.7	23.1	10	MC	
	5			– sample wet, at 4 feet.						
	6		CL	Clay w/ sand (CL); brown, moist to wet, stiff, fine sand	R2	94.1	24.2	17	MC	
	7									
	8		SM	Silty sand (SM); brown, wet, loose, fine sand	R3	101	24.2	5	MC	
	9									
	10		CL	Clay w/ sand (CL); brown, wet, soft, fine sand						
	11				R4	88.1	30.4	4	MC	
	12			Total Depth: 11.5 feet Groundwater encountered at 4 feet. Boring backfilled w/ cuttings.						
	13									
	14									
	15									

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LOG OF EXPLORATORY DRILLING

Project: PVCWD 24-Inch HDPE Pipeline **Logged By:** MiP **Project No.:** SC6042 **Boring:** B-2
Location: Station 37+62 **Elevation (ft.):** 27.0 **Weather:** Hazy/Warm
Drilling Contractor/Rig: R2/ Truck Mounted GT-17 **Drill Date:** 6/21/2022 **Hole Diameter (in):** 8

Elevation (feet)	Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig.	Dry Unit Weight (pcf)	Moisture Content (%)	Field Blow Count	Sample Type	Remarks
	0		SM	Artificial Fill: Gravelly sand w/ silt (SM); light brown, slightly moist, medium dense, fine to medium sand, fine gravel						
	2		CL	Clay w/ sand (CL); brown, moist, medium stiff, fine sand						
	3		CL	Alluvium: Clay (CL); brown, moist, medium stiff, fine sand						
	6		ML	Sandy Silt (ML); brown, very moist, medium stiff, fine sand, scattered calcareous deposits	R1	86.3	31.1	8	MC	
	10		CL	Clay w/ sand (CL); mottled light brown and brown, very moist, soft, fine sand, few calcareous deposits	R2	85.2	29.4	4	MC	
	12		SM	Silty sand (SM); tan, very moist to wet, medium dense, fine to medium sand, scattered calcareous deposits	R3	97.4	17.9	28	MC	
	15									

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Figure No.: A-2a

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LOG OF EXPLORATORY DRILLING

Project: PVCWD 24-Inch HDPE Pipeline **Logged By:** MiP **Project No.:** SC6042 **Boring:** B-2
Location: Station 37+62 **Elevation (ft.):** 27.0 **Weather:** Hazy/Warm
Drilling Contractor/Rig: R2/ Truck Mounted GT-17 **Drill Date:** 6/21/2022 **Hole Diameter (in):** 8

Elevation (feet)	Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig.	Dry Unit Weight (pcf)	Moisture Content (%)	Field Blow Count	Sample Type	Remarks
	15			–increased silt, at 15 feet.						
	16				R4	114.7	14.9	9	MC	
	17			Clay w/ sand (CL); dark grey, very moist to wet, soft, fine sand, few calcareous deposits						
	18		CL		R5	88.2	25.2	6	MC	
	19									
	20			Clayey sand (SC); mottled grey to dark brown, wet, loose, fine sand, few calcareous deposits						
	21				R6	92.9	25	12	MC	
	22		SC							
	23									
	24									
	25			Silty sand (SM); mottled grey to dark brown, wet, dense, fine to medium sand	R7	107.3	15.2	46	MC	
	26		SM							
	27			Total Depth: 26.5 feet Groundwater stabilized to 18.5 feet. Boring backfilled w/ cuttings.						
	28									
	29									
	30									

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Figure No.: A-2b

COTTON, SHIRES AND ASSOCIATES, INC.

LOG OF EXPLORATORY DRILLING

Project: PVCWD 24-Inch HDPE Pipeline **Logged By:** MiP **Project No.:** SC6042 **Boring:** B-3
Location: Station 37+91 **Elevation (ft.):** 28.0 **Weather:** Hazy/Warm
Drilling Contractor/Rig: R2/ Truck Mounted GT-18 **Drill Date:** 6/21/2022 **Hole Diameter (in):** 8

Elevation (feet)	Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig.	Dry Unit Weight (pcf)	Moisture Content (%)	Field Blow Count	Sample Type	Remarks
	0		SM	Artificial Fill: Gravelly sand w/ silt (SM); brown, moist, medium dense, fine to medium sand, fine gravel						Bulk: 1'-5' Moisture: 10.7%
	2		MH	Silt w/ sand (ML); light brown, moist, medium stiff, fine to medium sand						
	3		CL	Natural soil: Clay (CL); mottled dark brown, moist, medium stiff, scattered calcareous deposits						
	6				R1	85.4	30.2	9	MC	
	7		SM	Silty sand (SM); brown, moist, medium dense, fine grained, scattered calcareous deposits						
	11		CL	Clay (CL); brown, very moist to wet, soft, scattered calcareous deposits	R2	90.7	21.1	5	MC	
	13			–light brown, at 13 feet.	R3	99.6	22.4	8	MC	
	15									

COTTON, SHIRES AND ASSOCIATES, INC.
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Figure No.: A-3a

COTTON, SHIRES AND ASSOCIATES, INC.

LOG OF EXPLORATORY DRILLING

Project: PVCWD 24-Inch HDPE Pipeline **Logged By:** MiP **Project No.:** SC6042 **Boring:** B-3
Location: Station 37+91 **Elevation (ft.):** 28.0 **Weather:** Hazy/Warm
Drilling Contractor/Rig: R2/ Truck Mounted GT-18 **Drill Date:** 6/21/2022 **Hole Diameter (in):** 8

Elevation (feet)	Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig	Dry Unit Weight (pcf)	Moisture Content (%)	Field Blow Count	Sample Type	Remarks
	15			Silty sand (SM); tan, wet, loose, medium sand						
	16		SM		R4	107.3	18.8	9	MC	
	17			Clay (CL); dark grey, wet, soft to medium stiff, few calcareous deposits, few silty sand lenses						
	18				R5	86.2	30	7	MC	
	19									
	20									
	21				R6	92.4	28.2	6	MC	
	22		CL							
	23									
	24									
	25									
	26			–increased sand, at 26 feet.	R7	104.9	24.8	20	MC	
	27			Total Depth: 26.5 feet Groundwater stabilized to 23 feet. Boring backfilled w/ cuttings.						
	28									
	29									
	30									

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Figure No.: A-3b

COTTON, SHIRES AND ASSOCIATES, INC.

LOG OF EXPLORATORY DRILLING

Project: PVCWD 24-Inch HDPE Pipeline **Logged By:** MiP **Project No.:** SC6042 **Boring:** B-4
Location: Station 59+75 **Elevation (ft.):** 29.5 **Weather:** Sunny/Windy
Drilling Contractor/Rig: R2/ Truck Mounted GT-19 **Drill Date:** 6/21/2022 **Hole Diameter (in):** 8

Elevation (feet)	Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig.	Dry Unit Weight (pcf)	Moisture Content (%)	Field Blow Count	Sample Type	Remarks
	0			Pavement: 6" AC over 4" AB						
	1		SM	Artificial Fill: Silty sand w/ gravel (SM); brown to dark brown, moist, medium dense, fine to medium coarse, gravel decreases with depth						Bulk: 1'-2.5' Moisture: 17.7%
	2									
	3									
	4		MH	Alluvium: Silt with sand (MH); dark brown, moist, medium stiff, fine sand, few calcareous deposits, elastic	R1	94.1	14.1	6	MC	
	5			Clay with sand (CL); dark brown to light brown, very moist, medium stiff, fine sand, scattered calcareous deposits						
	6				R2	86.1	31.1	11	MC	
	7									
	8		CL	--increased sand, at 8 feet.	R3	82.4	32.1	6	MC	
	9									
	10									
	11			--increased calcareous deposits, wet, at 11 feet.	R4	82.4	37.3	8	MC	
	12			Total Depth: 11.5 feet Groundwater encountered at 11 feet. Boring backfilled w/ cuttings and capped w/ cold patch at surface						
	13									
	14									
	15									

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Figure No.: A-4

COTTON, SHIRES AND ASSOCIATES, INC.

LOG OF EXPLORATORY DRILLING

Project: PVCWD 24-Inch HDPE Pipeline **Logged By:** MiP **Project No.:** SC6042 **Boring:** B-5
Location: Station 86+43 **Elevation (ft.):** 35.0 **Weather:** Sunny/Windy
Drilling Contractor/Rig: R2/ Truck Mounted GT-20 **Drill Date:** 6/21/2022 **Hole Diameter (in):** 8

Elevation (feet)	Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig.	Dry Unit Weight (pcf)	Moisture Content (%)	Field Blow Count	Sample Type	Remarks
	0		CL	Articial Fill: Clay with sand (CL); brown, slightly moist, medium stiff, fine sand						
	3		ML	Alluvium: Sandy silt (ML); mottled light and dark brown, moist, very stiff, fine sand	R1	107.7	15.4	28	MC	Bulk: 2'-7' Fines: 75.3%
	5		SM	Silty sand (SM); brown, very moist, loose, fine sand	R2	89.4	23.1	7	MC	
	7		CL	Clay (CL); dark brown, very moist, stiff, scattered calcareous deposits	R3	86.9	26.8	18	MC	
	10			–mottled dark brown to light brown, at 10 feet.	R4	90.6	27.6	11	MC	
	11.5			Total Depth: 11.5 feet No groundwater encountered Boring backfilled w/ cuttings						

COTTON, SHIRES AND ASSOCIATES, INC.
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Figure No.: A-5

COTTON, SHIRES AND ASSOCIATES, INC.

LOG OF EXPLORATORY DRILLING

Project: PVCWD 24-Inch HDPE Pipeline **Logged By:** MiP **Project No.:** SC6042 **Boring:** B-6
Location: Station 87+69 **Elevation (ft.):** 33.5 **Weather:** Sunny/Windy
Drilling Contractor/Rig: R2/ Truck Mounted GT-21 **Drill Date:** 6/21/2022 **Hole Diameter (in):** 8

Elevation (feet)	Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig.	Dry Unit Weight (pcf)	Moisture Content (%)	Field Blow Count	Sample Type	Remarks
	0			Pavement: 4.5" AC over 4" AB						
	1		ML	Artificial Fill: Sandy silt (ML); brown, slightly moist, medium stiff, fine sand						
	2		ML	Alluvium: Sandy silt (ML); dark brown to black, very moist, stiff, fine sand, lenses of fine sand in upper foot, few calcareous deposits						
	3		ML		R1	97.3	22.7	14	MC	
	4		ML							
	5		CL	Clay (CL); brown, very moist, medium to very stiff increasing with depth, fine, scattered to abundant calcareous deposits increasing with depth						
	6		CL		R2	101.5	22.5	31	MC	
	7		CL							
	8		CL	--silty sand lense, at 8 feet.	R3	99.4	21.3	9	MC	
	9		CL							
	10		CL							
	11		CL		R4	103.8	20.9	16	MC	
	12			Total Depth: 11.5 feet No groundwater encountered. Boring backfilld w/ cuttings and capped w/ cold patch at surface						
	13									
	14									
	15									

COTTON, SHIRES AND ASSOCIATES, INC.
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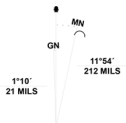
Figure No.: A-6



COTTON, SHIRES AND ASSOCIATES, INC.
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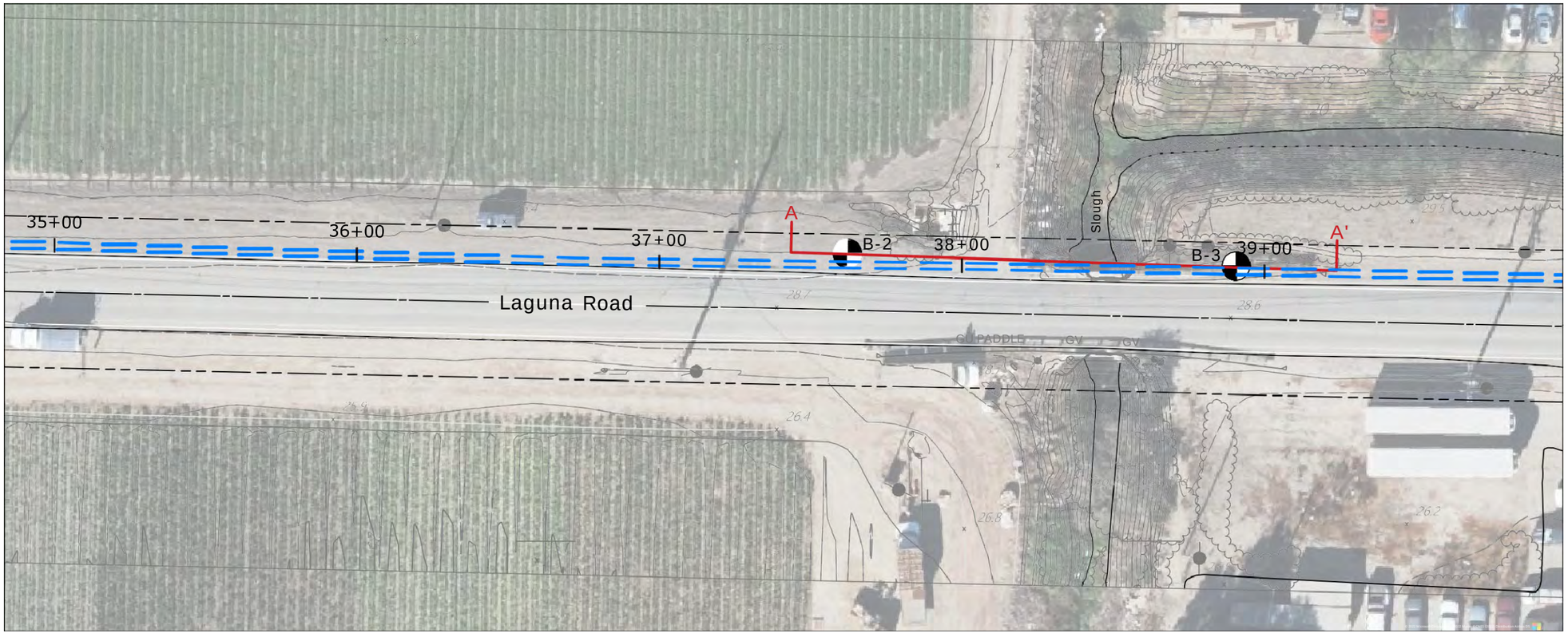
Site Vicinity Map
PVCWD 24-Inch HDPE Pipeline
CAMARILLO, CALIFORNIA

GEO/ENG BY	SCALE	PROJECT NO.
MiP	1" = ½ mi	SC6042
APPROVED BY	DATE	FIGURE NO.
MJJ	August 2022	1



Explanation

Map Symbols

B-6 — Hollow-Stem Auger Exploratory Boring (Cotton, Shires and Associates, 2022)

Right of Way Limits

Road Centerline

A — A' Location of Engineering Geologic Cross Section

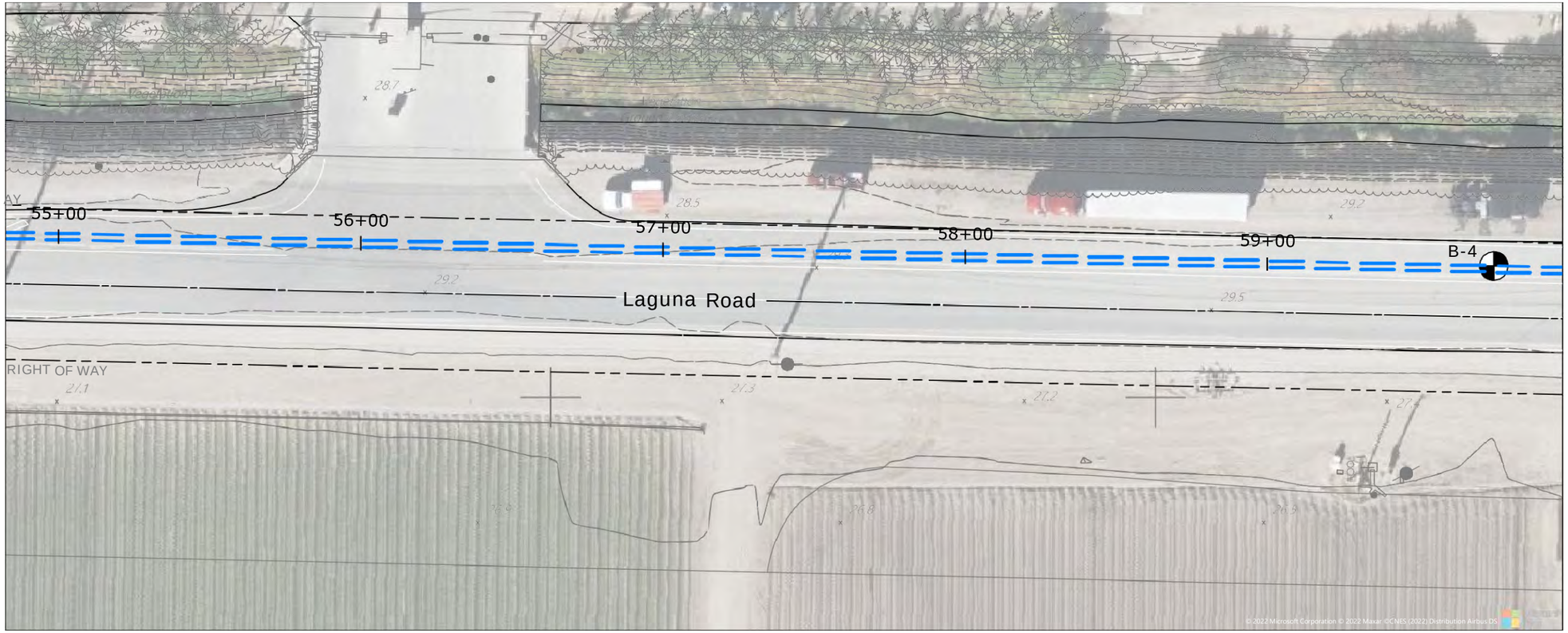
Proposed Pipeline ALignment

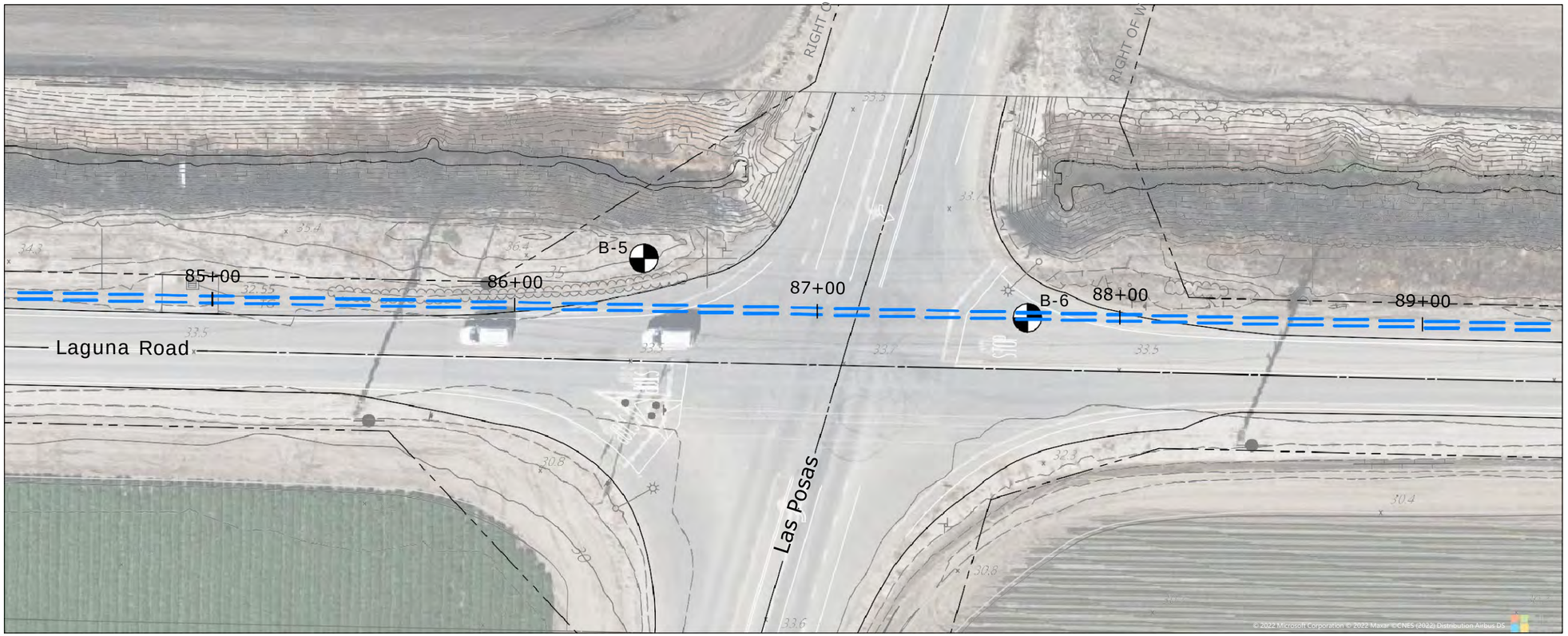
Reference: MKN Boring Plans dated May 2022 (Sheets B-1 through B-9)

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

Site Exploration Map
PVCWD 24-Inch HDPE Pipeline
CAMARILLO, CALIFORNIA

GEO/ENG BY MiP	SCALE 1"=40'	PROJECT NO. SC6042
APPROVED BY MJJ	DATE August 2022	FIGURE NO. 2a





Explanation

Map Symbols

B-6 — Hollow-Stem Auger Exploratory Boring (Cotton, Shires and Associates, 2022)

Right of Way Limits

Road Centerline

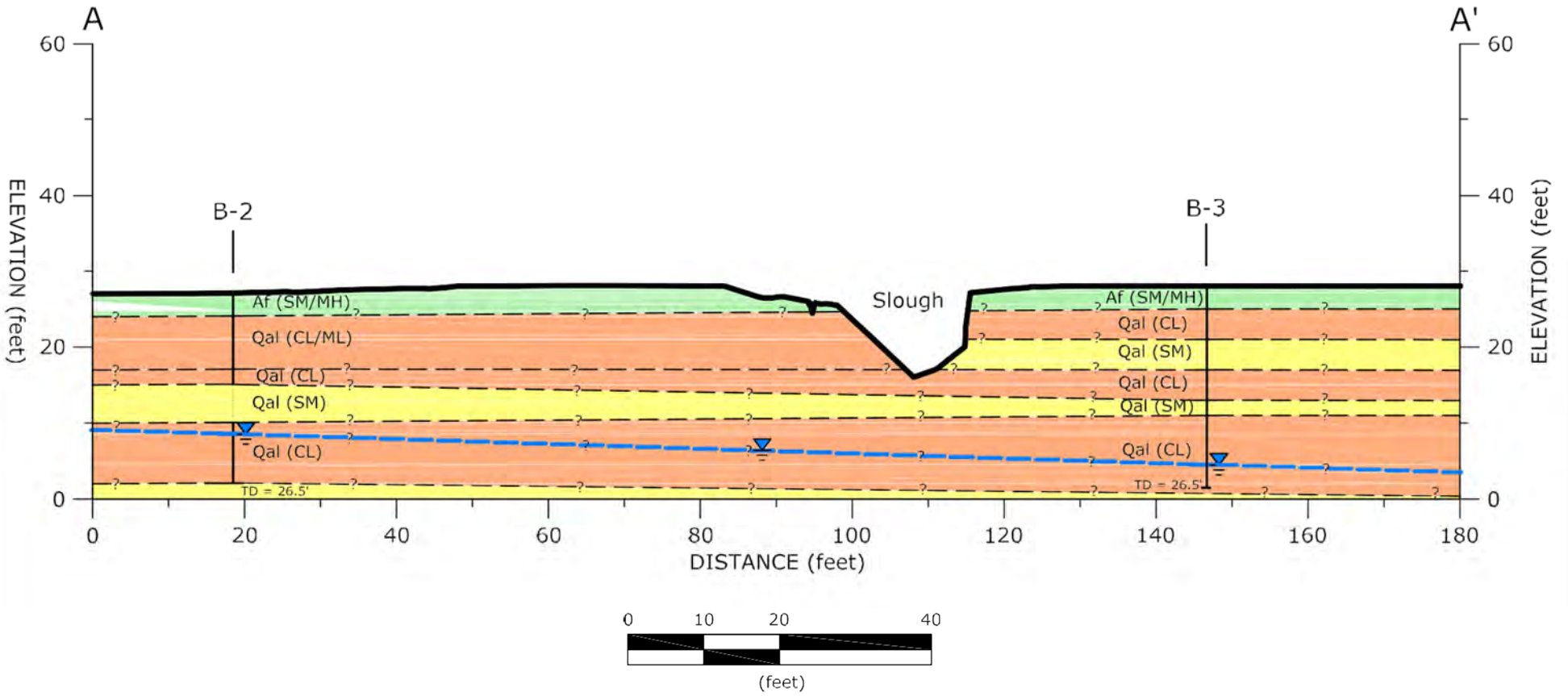
Proposed Pipeline ALignment

Reference: MKN Boring Plans dated May 2022 (Sheets B-1 through B-9)

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

Site Exploration Map
PVCWD 24-Inch HDPE Pipeline
CAMARILLO, CALIFORNIA

GEO/ENG BY MiP	SCALE 1"=40'	PROJECT NO. SC6042
APPROVED BY MJJ	DATE August 2022	FIGURE NO. 2b



LEGEND

EARTH MATERIALS

- Af (SM/MH) — Af - Artificial Fill (Gravely sand with Silt and Silt with sand)
- Qal(CL/ML) — Qal - Alluvium (Clay/Silt and Clay/Silt with Sand)
- Qal(SM) — Qa - Alluvium (Silty Sand)

SYMBOLS

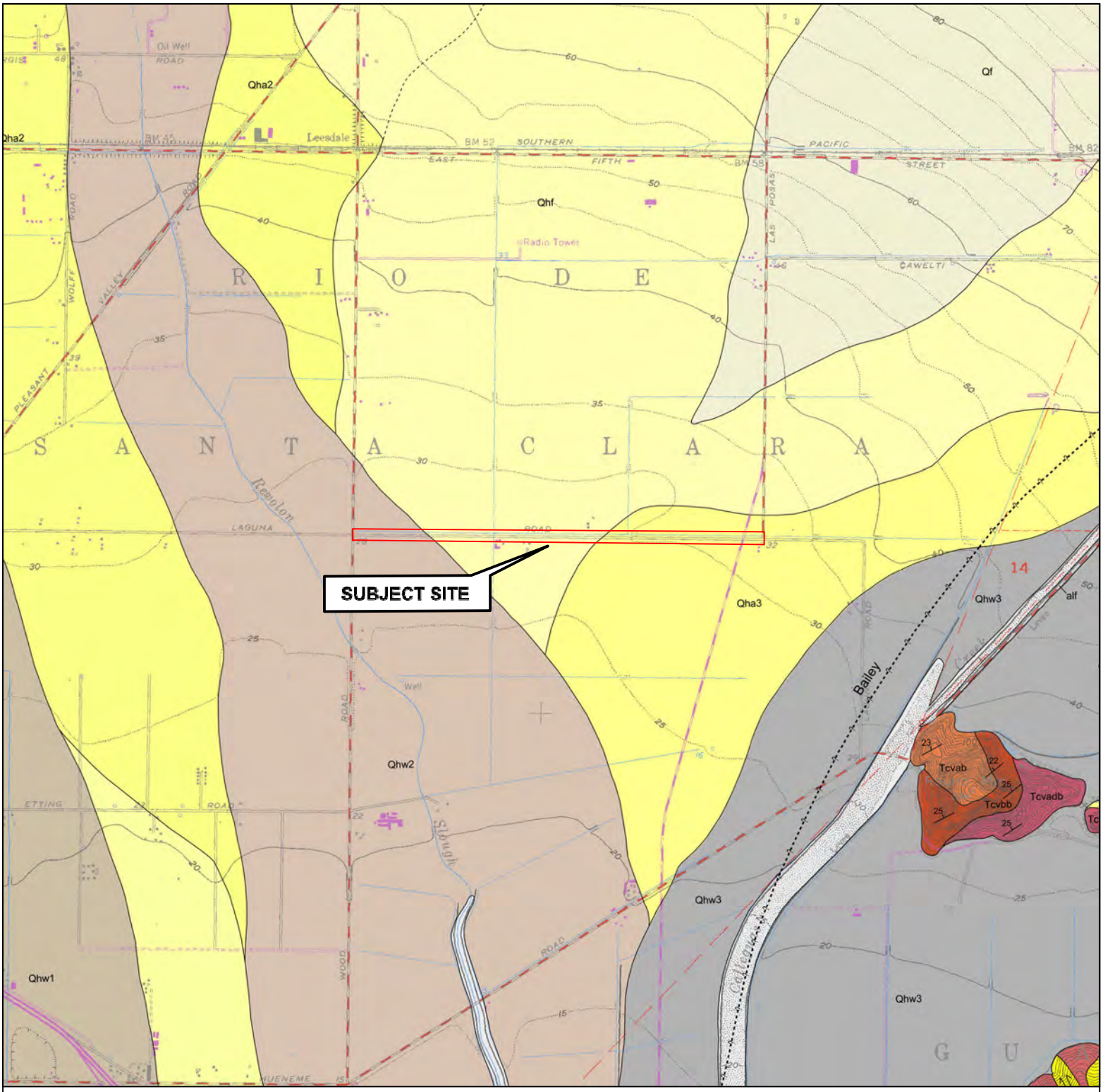
- B-2 / TD = 26.5' — Hollow-Stem Auger Exploratory Boring (Cotton, Shires and Associates, 2022)
- Geologic Contact; dashed where approximate, queried where uncertain
- Stabilized groundwater level during CSA exploration (June,2022), queried when uncertain

Reference: MKN Boring Plans dated May 2022 (Sheets B-1 through B-9)

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

ENGINEERING GEOLOGIC CROSS SECTION A-A'
PVCWD 24 - Inch HDPE Pipeline
CAMARILLO, CALIFORNIA

GEO/ENG BY	SCALE	PROJECT NO.
MiP	1"=20'	SC6042
APPROVED BY	DATE	FIGURE NO.
MJJ	August 2022	3



Reference: Geologic Map of the Camarillo 7.5' Quadrangle, Ventura, California, by Tan, S.S., Clahan, K.B., Hitchcock, C.S., 2004

0 1/2 mi 1 mi

1" = 1/2 mi

N

EXPLANATION:

Qhf - Alluvial fan deposits (Holocene)
Qhw_2 - Wash deposits, Unit 2 (Holocene)
Qha_3 - Alluvial deposits, Unit 3 (Holocene)

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

Regional Geologic Map
PVCWD 24-Inch HDPE Pipeline
CAMARILLO, CALIFORNIA

GEO/ENG BY	SCALE	PROJECT NO.
MiP	1" = ½ mi	SC6042
APPROVED BY	DATE	FIGURE NO.
MJJ	August 2022	4

APPENDIX A
FIELD EXPLORATION

APPENDIX A – FIELD EXPLORATION

HOLLOW-STEM AUGER BORINGS

CSA performed a subsurface exploration program in June 2022 consisting of six (6) exploratory hollow-stem auger borings along the proposed pipeline alignment. The borings ranged in depth from about 11.5 to 26.5 feet bgs and were excavated by means of a truck-mounted drill rig equipped with an 8-inch diameter hollow-stem auger provided by 2R Drilling of Chino, California. The locations of the borings are shown on Figures 2 and 3.

A CSA staff geologist logged the borings under the direct supervision of a registered geotechnical engineer and visually classified the soils in accordance with ASTM D-2487. Both bulk and relatively undisturbed and disturbed samples were obtained of the materials encountered at selected depths. The undisturbed samples were obtained in brass liners that were 2.5 inches in outside diameter and 6 inches long; the liners were inside a 3-inch diameter modified split-barrel California Sampler. The disturbed samples were obtained with an SPT sampler that was 2 inches in outside diameter. Both samplers were driven by an automatic, 140-pound hammer that was dropped 30 inches.

Logs of the borings are presented as Figures A-1 through A-6. The logs depict our interpretation of the subsurface conditions at the date and location indicated based on representative samples collected at roughly two- to five-foot sampling intervals. It is not warranted that they are representative of subsurface conditions at other times and locations. The contacts on the log represent the approximate boundaries between earth materials, and the transitions between these materials may be gradual.

APPENDIX B
LABORATORY TESTING

APPENDIX B - LABORATORY TESTING

INTRODUCTION

The laboratory analysis performed for the site consisted of limited testing of the principal soil types sampled during the field investigation to evaluate index properties of subsurface materials. Laboratory tests were performed on selected driven ring or bulk soil samples to estimate engineering characteristics of the various earth materials encountered. Testing was performed in general accordance with ASTM Standards for Soil Testing, latest revision. The soil descriptions and the field and laboratory test results were used to assign parameters to the various materials at the site. Testing procedures are presented below, and results of the laboratory testing program are presented in this appendix, and the boring logs included in Appendix A.

Laboratory Moisture and Density Determinations

Moisture content and dry density determinations were performed select driven ring samples collected to evaluate the natural water content and dry density of the various soils encountered in accordance with ASTM D7263. In addition, moisture contents were determined on select collected bulk samples in accordance with ASTM D2216. The results are presented on Table B-1 – Summary of Laboratory Test Results, and the respective boring logs in Appendix A.

Grain Size Distribution

Grain size distribution were determined for two selected soil samples in accordance with standard test method ASTM D422. In addition, five tests were performed to determine the amount of material in soils finer than the No. 200 Sieve in accordance with ASTM test method D1140. The results are presented on Table B-1 and on Figures B-1a and B-1b – Gradation Curves.

Atterberg Limits Tests

Atterberg limits tests were performed on five selected samples. Liquid and plastic limits were determined in accordance with standard test method ASTM D4318. The results are presented on Table B-1 and on Figure B-2 – Atterberg Limits' Test.

Direct Shear Tests

Four multistage direct shear tests were performed on a representative driven ring sample to evaluate the shear strength of earth materials. The tests were performed in

accordance with standard test method ASTM D3080. The results are presented on Table B-1 and on Figures B-3a through B-3d – Shear Test Diagram.

Maximum Unit Weight/Optimum Moisture Content Tests

Two maximum unit weight and optimum moisture content tests were performed on selected samples of the near surface onsite soils to assess their compaction characteristics. The tests were performed in accordance with ASTM D1557, and the results are presented on Table B-1 and on Figures B-4a and 4b – Moisture-Density Relationship.

R-Value Test

One R-value test was performed on selected samples of surficial earth material. The tests were performed in accordance with standard test method ASTM D2844 and test results are presented on Table B-1 and Figure B-5 – R-Value.

Expansion Index Tests

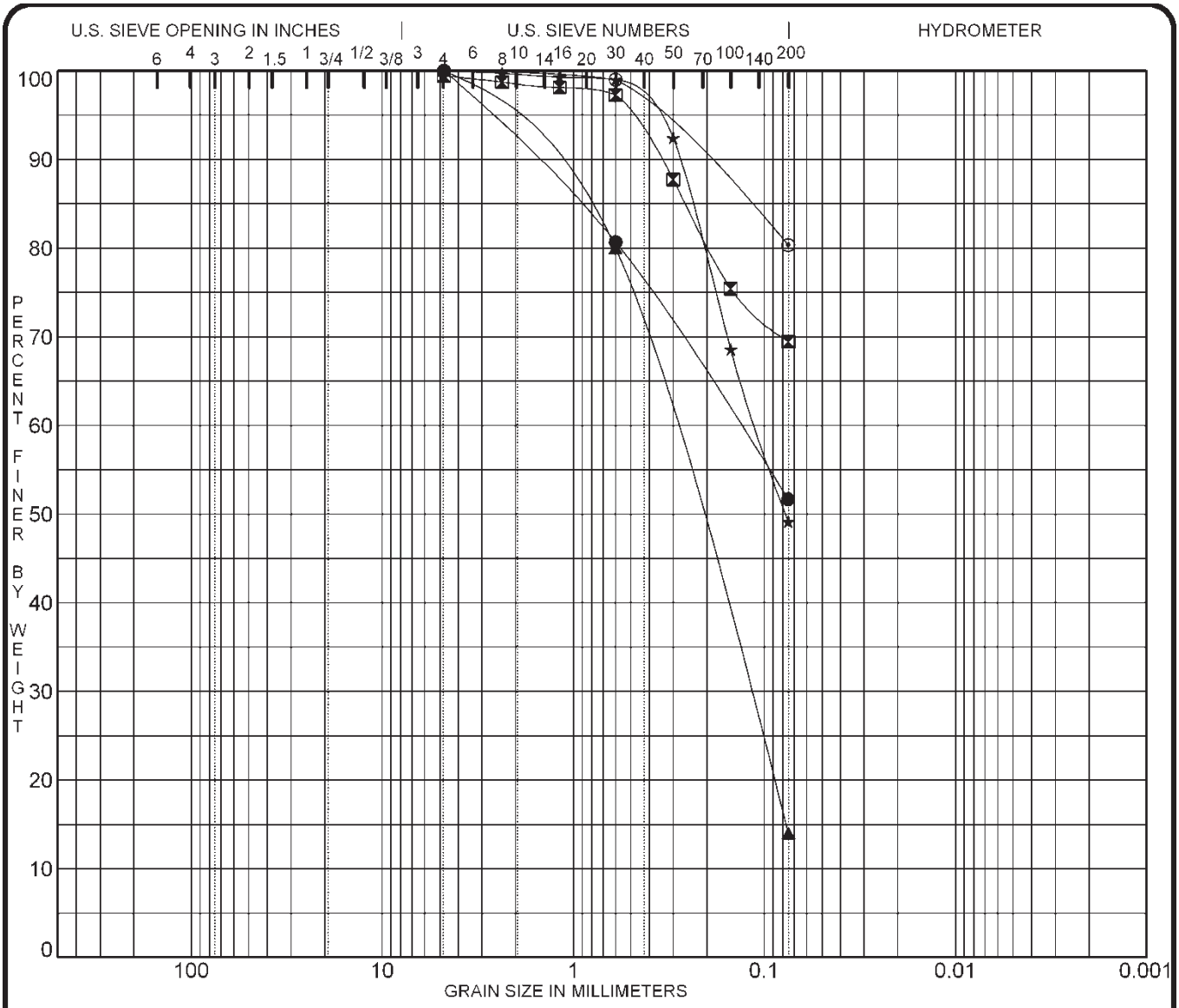
Two Expansion Index tests were performed on near-surface soils to estimate their expansion characteristics. The tests were performed in general accordance with ASTM D4829, and test results are presented on Table B-1.

Soil Chemistry Tests/Corrosion Tests

One soil corrosion suite was performed on a sample to evaluate resistivity, pH, sulfate, and chloride. The results of the testing and an analysis of the corrosivity to pipe and concrete materials are summarized in the main report. Test results are presented on Table B-1.

TABLE B-1
SUMMARY OF LABORATORY TEST RESULTS

Boring	Depth	USCS	Moisture Content	In-Situ Moist Unit Weight	In-Situ Dry Unit Weight	Passing #200 Sieve	Atterberg Limits		Expnsion Index	'R' Value	Shear Strength		Maximum Unit Weight / Optimum Moisture Content		Corrosion Potential			
							LL	PL										
No.	(feet)	Symbol	(%)	(pcf)	(pcf)	(%)	(%)	(%)	EI	'R'	f (deg)	c (psf)	Density (pcf)	Moisture (%)	Resistivity (ohm)	pH	Chorides (%)	Sulfates (%)
B-1	1.0	ML	21.3	--	--	51.7	--	--	20	--	--	--	124.0	7.6	--	--	--	--
B-1	3.0	MH	23.1	105.5	85.7	--	50	30	--	--	25	200	--	--	--	--	--	--
B-1	6.0	CL	24.2	116.9	94.1	--	--	--	--	--	--	--	--	--	--	--	--	--
B-1	8.0	SM	24.2	125.4	101.0	--	--	--	--	--	--	--	--	--	--	--	--	--
B-1	11.0	CL	30.4	114.9	88.1	--	--	--	--	--	--	--	--	--	--	--	--	--
B-2	6.0	SM	31.1	113.1	86.3	69.4	--	--	--	--	--	--	--	--	--	--	--	--
B-2	11.0	CL	29.4	110.2	85.2	--	--	--	--	--	--	--	--	--	--	--	--	--
B-2	13.0	SM	17.9	114.8	97.4	14.0	--	--	--	--	--	--	--	--	--	--	--	--
B-2	16.0	SM	14.9	131.8	114.7	--	--	--	--	--	30	50	--	--	--	--	--	--
B-2	18.0	CL	25.2	110.4	88.2	--	--	--	--	--	--	--	--	--	--	--	--	--
B-2	21.0	SC	25.0	116.1	92.9	49.1	--	--	--	--	--	--	--	--	--	--	--	--
B-2	26.0	SM	15.2	123.6	107.3	--	--	--	--	--	--	--	--	--	--	--	--	--
B-3	1.0	SM	10.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-3	6.0	CL	30.2	111.2	85.4	--	--	--	--	--	--	--	--	--	--	--	--	--
B-3	11.0	CL	21.1	109.8	90.7	--	34	22	--	--	--	--	--	--	--	--	--	--
B-3	13.0	CL	22.4	121.9	99.6	--	--	--	--	--	21	250	--	--	--	--	--	--
B-3	16.0	SM	18.8	127.5	107.3	--	--	--	--	--	--	--	--	--	--	--	--	--
B-3	18.0	CL	30.0	112.1	86.2	--	--	--	--	--	--	--	--	--	--	--	--	--
B-3	21.0	CL	28.2	118.5	92.4	--	--	--	--	--	--	--	--	--	--	--	--	--
B-3	26.0	CL	24.8	130.9	104.9	--	--	--	--	--	--	--	--	--	--	--	--	--
B-4	1.0	SM	17.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-4	3.5	MH	14.1	107.4	94.1	--	65	40	--	--	--	--	--	--	--	--	--	--
B-4	6.0	CL	31.1	112.9	86.1	--	--	--	--	--	--	--	--	--	--	--	--	--
B-4	8.0	CL	32.1	108.9	82.4	80.3	--	--	--	--	--	--	--	--	--	--	--	--
B-4	11.0	CL	37.3	113.1	82.4	--	--	--	--	--	--	--	--	--	--	--	--	--
B-5	2.0	CL	--	--	--	58.0	27	16	23	20	--	--	113.3	12.9	440	7.23	0.023	0.042
B-5	3.0	ML	15.4	124.3	107.7	75.3	--	--	--	--	--	--	--	--	--	--	--	--
B-5	6.0	SM	23.1	110.1	89.4	--	--	--	--	--	30	75	--	--	--	--	--	--
B-5	8.0	CL	26.8	110.2	86.9	--	--	--	--	--	--	--	--	--	--	--	--	--
B-5	11.0	CL	27.6	115.6	90.6	--	--	--	--	--	--	--	--	--	--	--	--	--
B-6	3.0	ML	22.7	119.4	97.3		--	--	--	--	--	--	--	--	--	--	--	--
B-6	6.0	CL	22.5	124.3	101.5	37	39	23	--	--	--	--	--	--	--	--	--	--
B-6	8.0	CL	21.3	120.6	99.4	--	--	--	--	--	--	--	--	--	--	--	--	--
B-6	11.0	CL	20.9	125.5	103.8	--	--	--	--	--	--	--	--	--	--	--	--	--



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		USCS Classification	MC%	LL	PL	PI	Cc	Cu
●	B-1	1.0	ML (1-5)	21					
⊠	B-2	6.0	ML	31					
▲	B-2	13.0	SM	18					
★	B-2	21.0	SC	25					
⊙	B-4	8.0	CL	32					

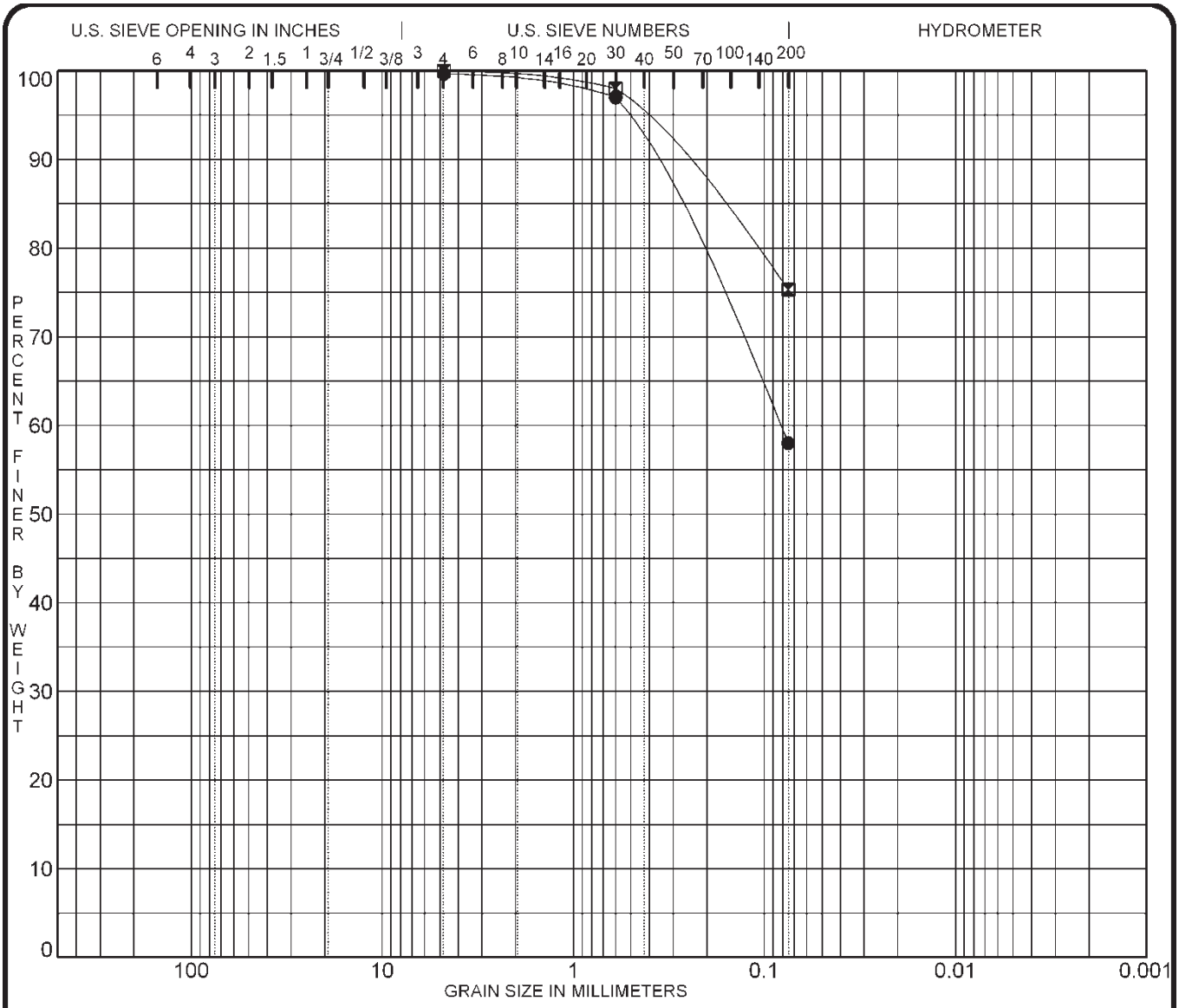
	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	1.0	4.75	0.14			0.0	48.3	51.7	
⊠	B-2	6.0	4.75				0.0	30.0	69.4	
▲	B-2	13.0	4.75	0.32	0.124		0.0	86.0	14.0	
★	B-2	21.0	4.75	0.11			0.0	50.9	49.1	
⊙	B-4	8.0	4.75				0.0	19.7	80.3	

PROJECT - COTTON SHIRES

GRADATION CURVES

PVCWD 24-Inch HDPE Pipeline
Camarillo, California

Figure B-1a



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		USCS Classification	MC%	LL	PL	PI	Cc	Cu
●	B-5	2.0	CL (2-7)		27	16	11		
⊠	B-5	3.0	ML	15					

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-5	2.0	4.75	0.08			0.0	41.7	58.0	
⊠	B-5	3.0	4.75				0.0	24.7	75.3	

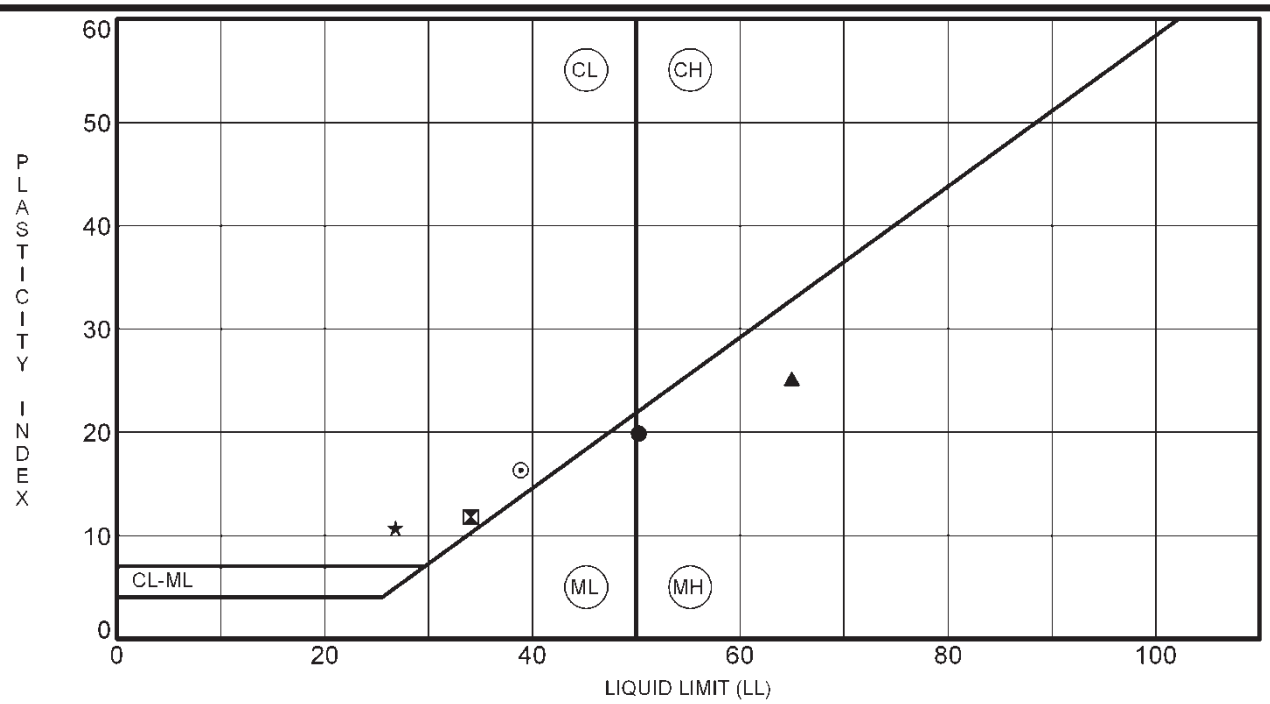
PROJECT - COTTON SHIRES

GRADATION CURVES

PVCWD 24-Inch HDPE Pipeline
Camarillo, California

Figure B-1b

PROJECT LOCATION: COTTON SHIRES PROJECT NO.: SC6042



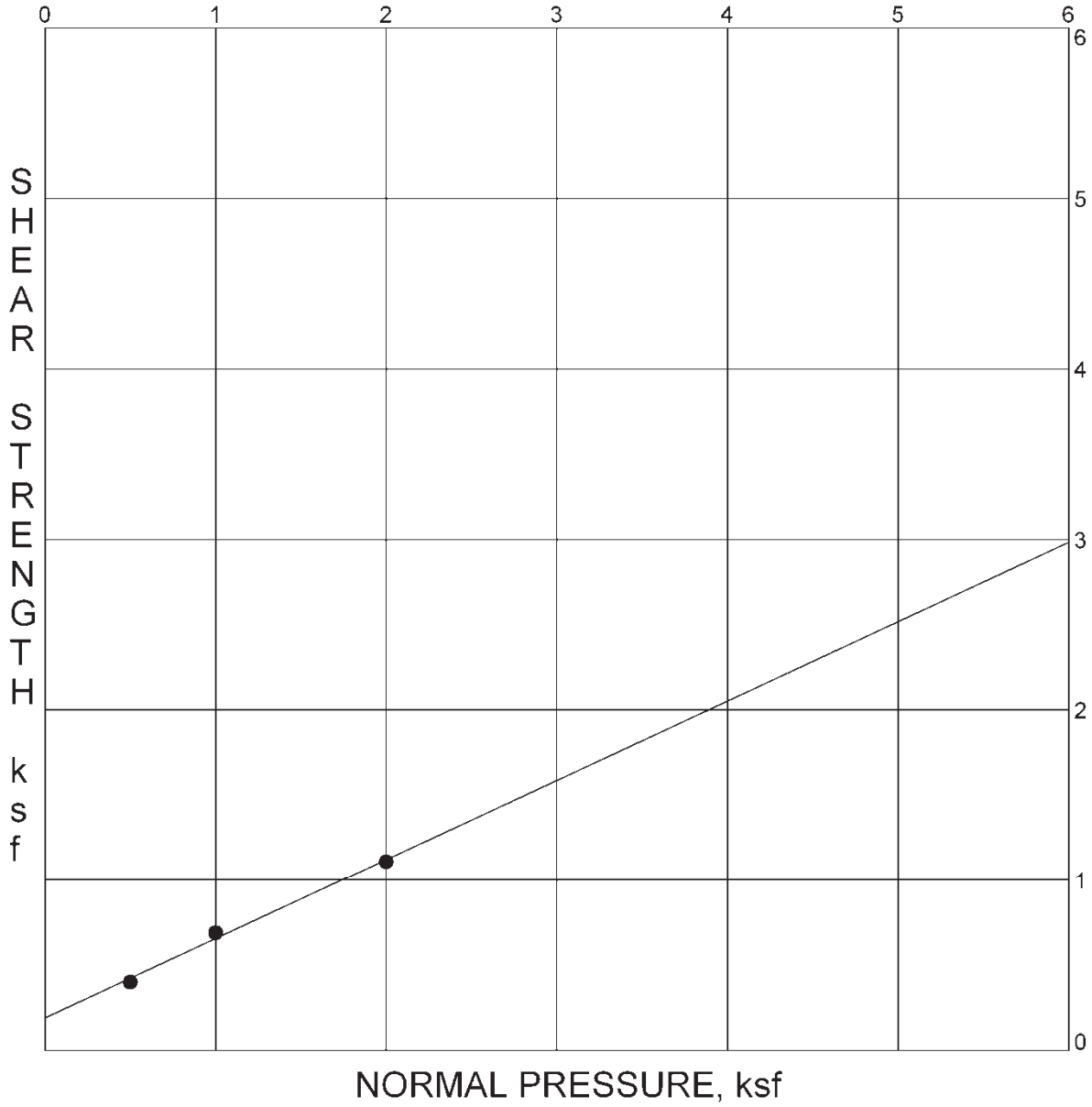
Specimen Identification			LL	PL	PI	Fines	Classification
●	B-1	3.0	50	30	20		MH
⊠	B-3	11.0	34	22	12		CL
▲	B-4	3.5	65	40	25		MH
★	B-5	2.0	27	16	11	58.0	SANDY LEAN CLAY CL
⊙	B-6	6.0	39	23	16		CL

ATTERBERG LIMITS' RESULTS

Figure A.1

PROJECT LOCATION: COTTON SHIRES | PROJECT NO.: SC6042

SAMPLE LOCATION: B-1 @ 3.0 | DESCRIPTION: MH



Test Results

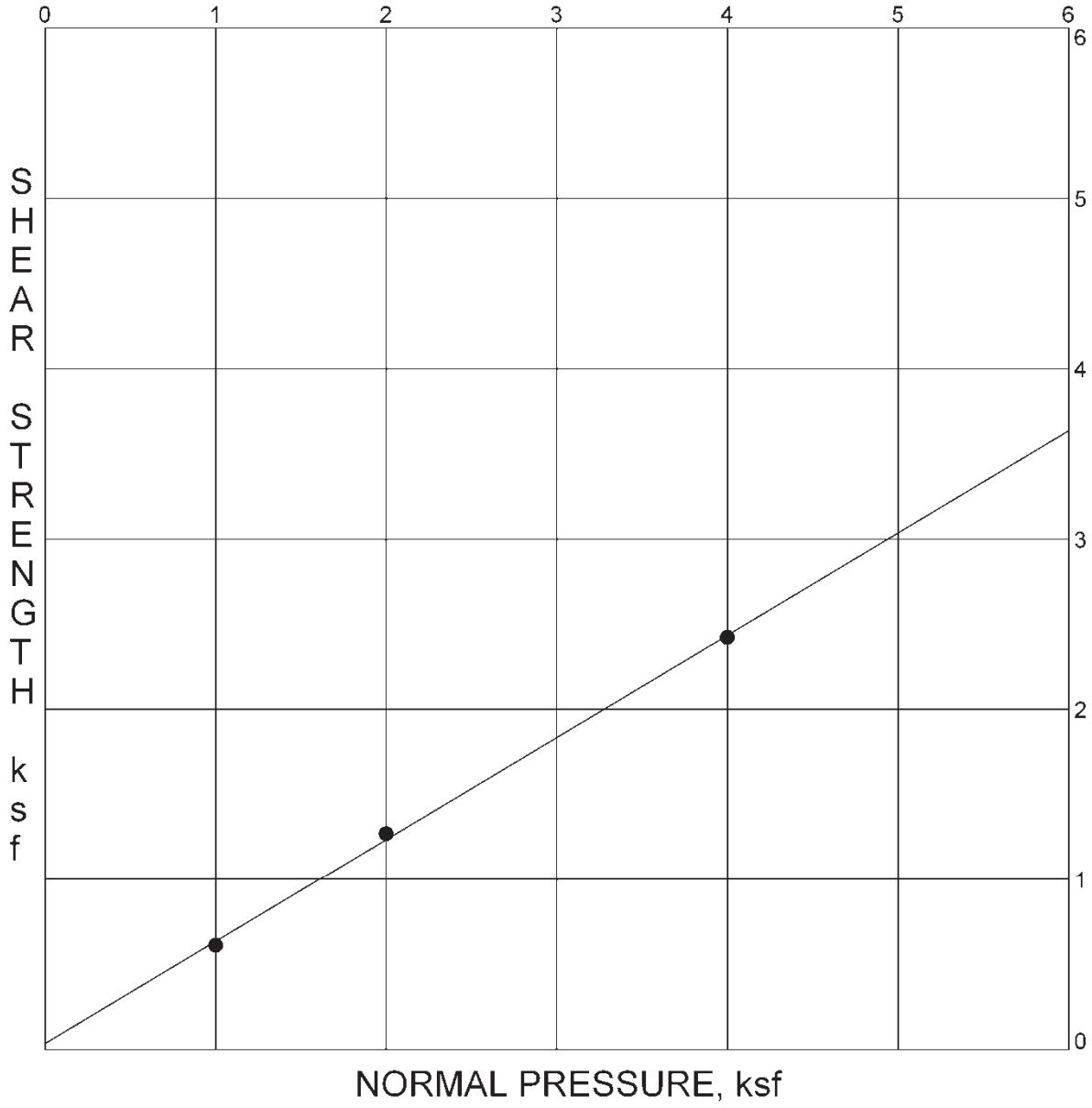
Moisture Content (%)	Density (pcf)	Ultimate Strength
Insitu: 23.1	Dry Density: 85.7	Phi (deg): 25.0
Saturated: 36.1		Cohesion (ksf): 0.200

SHEAR TEST DIAGRAM

Figure S.1

PROJECT LOCATION: COTTON SHIRES | PROJECT NO.: SC6042

SAMPLE LOCATION: B-2 @ 16.0 | DESCRIPTION: SM



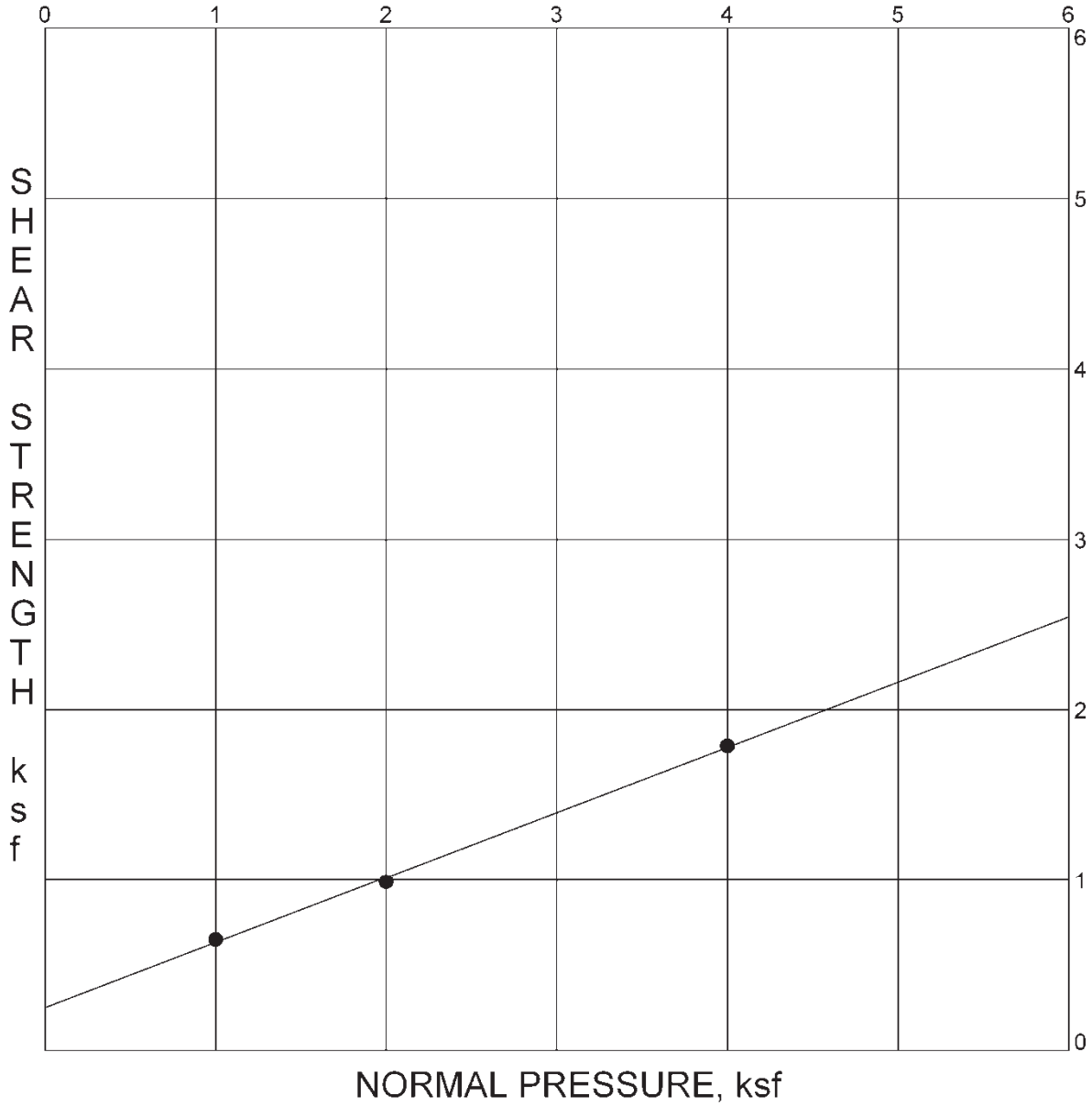
Test Results

Moisture Content (%)	Density (pcf)	Ultimate Strength
Insitu: 14.9	Dry Density: 114.7	Phi (deg): 30.0
Saturated: 14.6		Cohesion (ksf): 0.050

SHEAR TEST DIAGRAM

PROJECT LOCATION: COTTON SHIRES | PROJECT NO.: SC6042

SAMPLE LOCATION: B-3 @ 13.0 | DESCRIPTION: CL



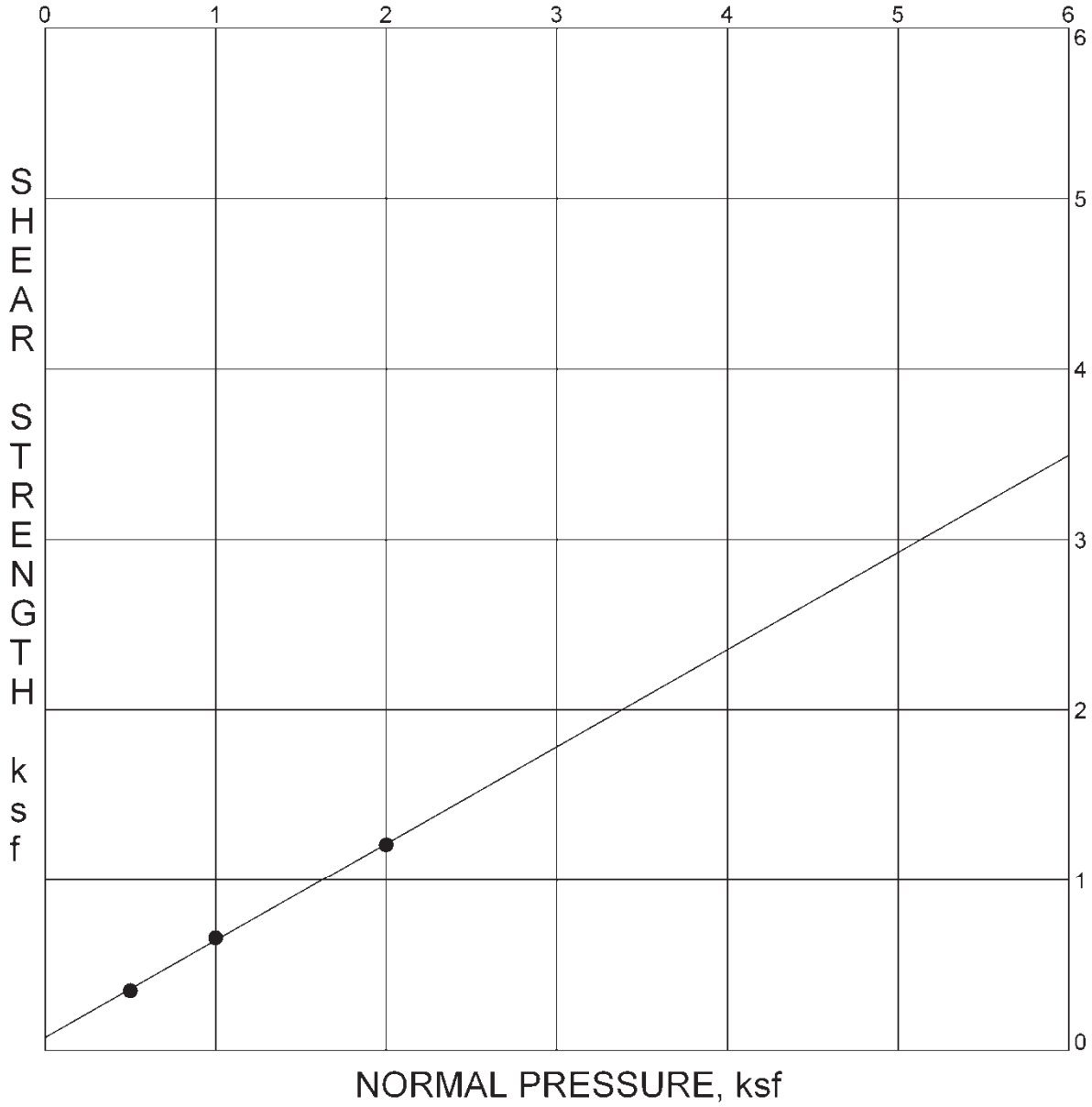
Test Results

Moisture Content (%)	Density (pcf)	Ultimate Strength
Insitu: 22.4	Dry Density: 99.6	Phi (deg): 21.0
Saturated: 25.8		Cohesion (ksf): 0.250

SHEAR TEST DIAGRAM

PROJECT LOCATION: COTTON SHIRES | PROJECT NO.: SC6042

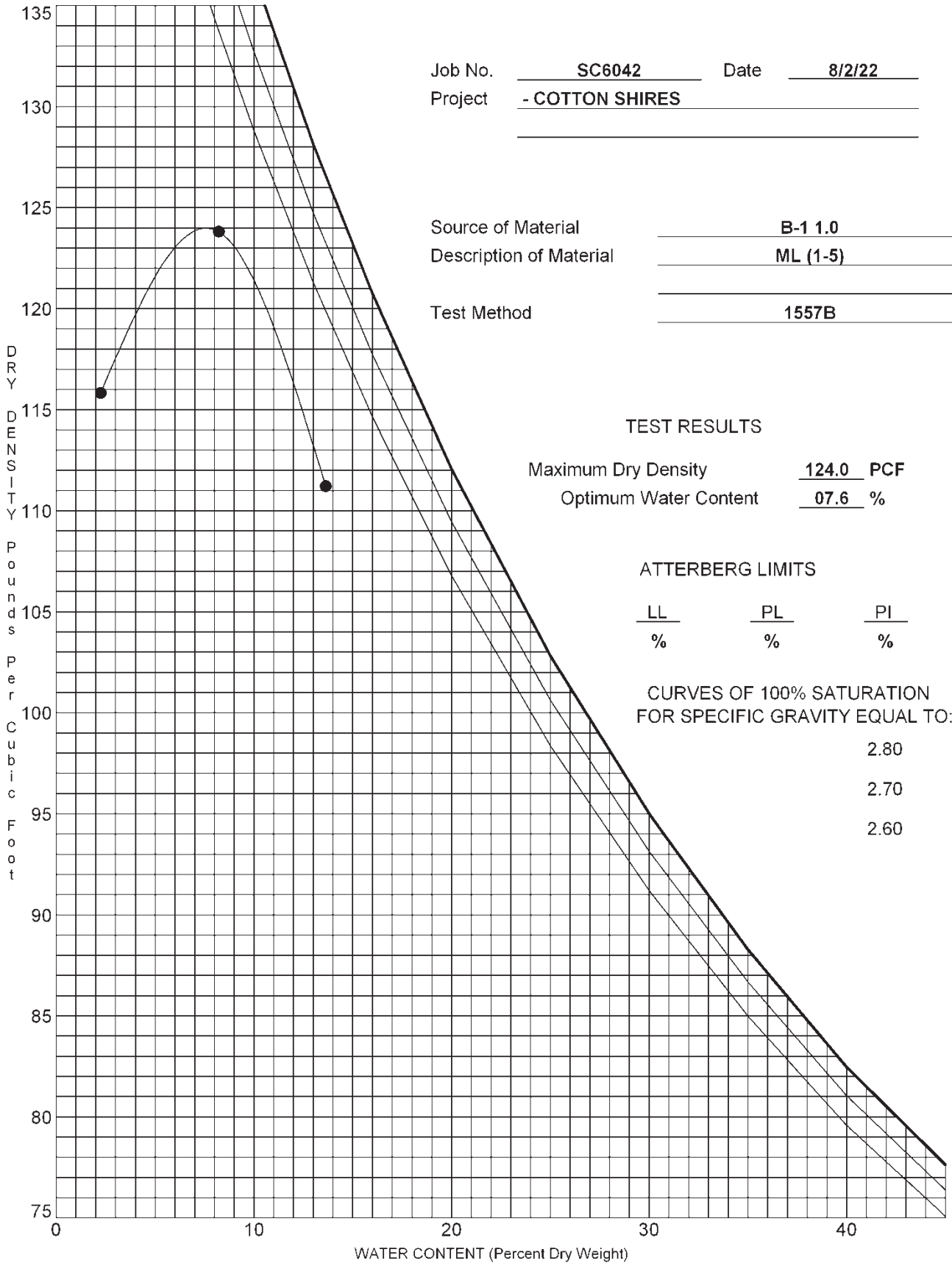
SAMPLE LOCATION: B-5 @ 6.0 | DESCRIPTION: SM



Test Results

Moisture Content (%)	Density (pcf)	Ultimate Strength
Insitu: 23.1	Dry Density: 89.4	Phi (deg): 30.0
Saturated: 33.1		Cohesion (ksf): 0.075

SHEAR TEST DIAGRAM



Job No. SC6042 Date 8/2/22

Project - COTTON SHIRES

Source of Material B-1 1.0

Description of Material ML (1-5)

Test Method 1557B

TEST RESULTS

Maximum Dry Density 124.0 PCF

Optimum Water Content 07.6 %

ATTERBERG LIMITS

LL	PL	PI
%	%	%

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.80

2.70

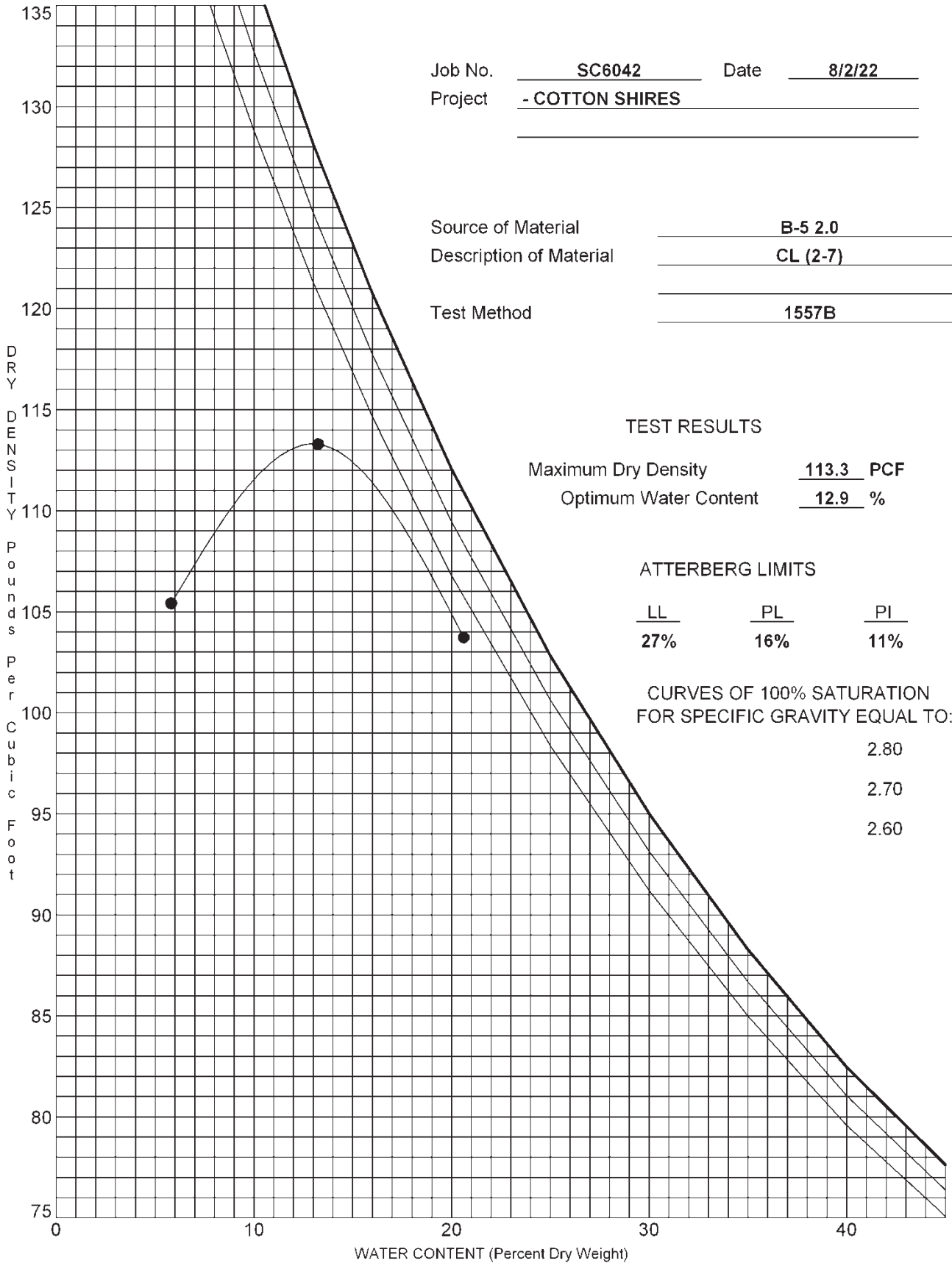
2.60

MOISTURE-DENSITY RELATIONSHIP

PVCWD 24-Inch HDPE Pipeline

Camarillo, California

Figure B-4a



Job No. SC6042 Date 8/2/22

Project - COTTON SHIRES

Source of Material B-5 2.0

Description of Material CL (2-7)

Test Method 1557B

TEST RESULTS

Maximum Dry Density 113.3 PCF

Optimum Water Content 12.9 %

ATTERBERG LIMITS

LL	PL	PI
27%	16%	11%

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.80

2.70

2.60

MOISTURE-DENSITY RELATIONSHIP

PVCWD 24-Inch HDPE Pipeline

Camarillo, California

Figure B-4b

'R' VALUE CA 301

Client: Geo Concepts Date: 7/12/22 By: LD

Client's Job No.: SC 6042 Sample : B-5 @ 2' - 7'

GLA Reference: 2010-0070 Soil Type: Brown, Silty Clay

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	**180**	**70**	**120**	
Initial Moisture Content	%	**6.1**	**6.1**	**6.1**	
Water Added	ml	**100**	**130**	**115**	
Moisture at Compaction	%	14.9	17.6	16.3	
Sample & Mold Weight	gms	**3202**	**3182**	**3166**	
Mold Weight	gms	**2092**	**2095**	**2096**	
Net Sample Weight	gms	1110	1087	1070	
Sample Height	in.	**2.535**	**2.53**	**2.48**	
Dry Density	pcf	115.4	110.7	112.4	
Pressure	lbs	**7260**	**3140**	**4880**	
Exudation Pressure	psi	578	250	389	
Expansion Dial	x 0.0001	**52**	**14**	**32**	
Expansion Pressure	psf	225	61	139	
Ph at 1000lbs	psi	**28**	**50**	**37**	
Ph at 2000lbs	psi	**64**	**121**	**93**	
Displacement	turns	**3.95**	**4.79**	**4.21**	
R' Value		49	14	30	
Corrected 'R' Value		**49**	**14**	**30**	

FINAL 'R' VALUE	
By Exudation Pressure (@ 300 psi):	**20**
By Epansion Pressure :	**23**
TI = 5	

Geo-Logic Associates

APPENDIX C
SEISMIC DESIGN PARAMETERS

Hazards by Location

Search Information

Address:	34.176,-119.083
Coordinates:	34.1761364, -119.0837968
Elevation:	25 ft
Timestamp:	2022-07-21T21:37:23.294Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D

Basic Parameters

Name	Value	Description
S_S	1.583	MCE_R ground motion (period=0.2s)
S_1	0.583	MCE_R ground motion (period=1.0s)
S_{MS}	1.583	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.055	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

▾Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.896	Coefficient of risk (0.2s)
CR_1	0.895	Coefficient of risk (1.0s)
PGA	0.687	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.755	Site modified peak ground acceleration

T_L	8	Long-period transition period (s)
SsRT	1.583	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.767	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.119	Factored deterministic acceleration value (0.2s)
S1RT	0.583	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.651	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.64	Factored deterministic acceleration value (1.0s)
PGAd	0.839	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Dynamic: Conterminous U.S. 2014 (u…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.176

Time Horizon

Return period in years

2475

Longitude

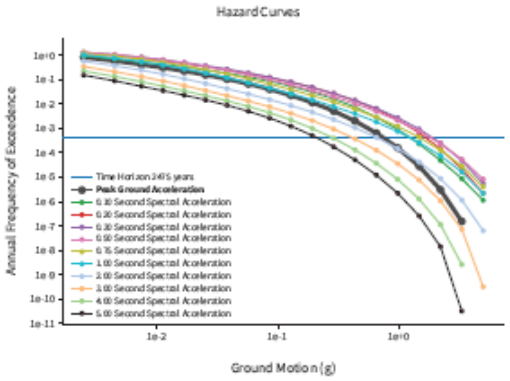
Decimal degrees, negative values for western longitudes

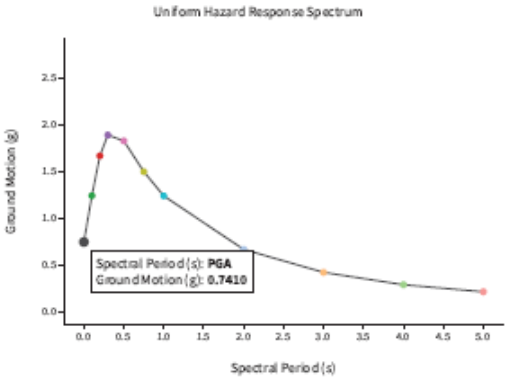
-119.083

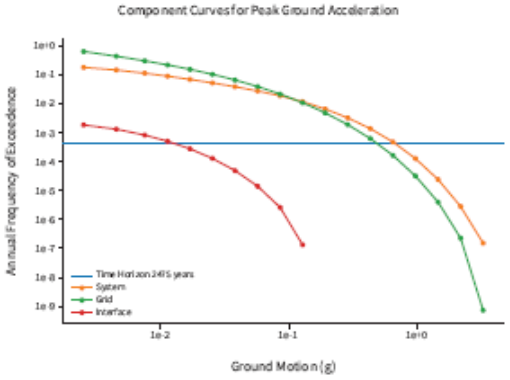
Site Class

259 m/s (Site class D)

Hazard Curve





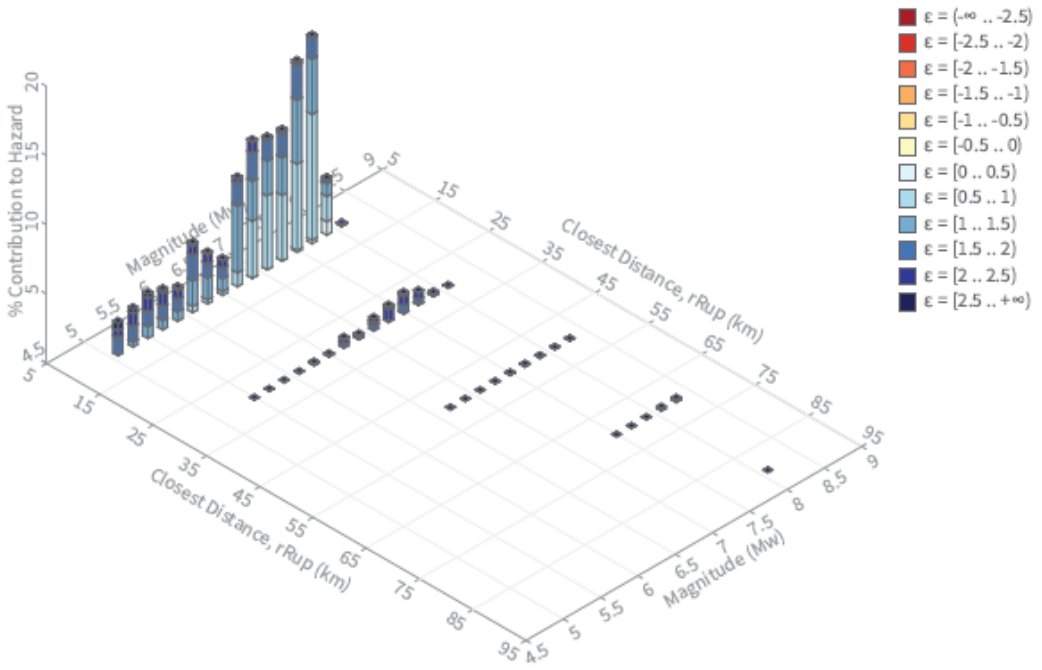


View Raw Data

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.74104335 g

Recovered targets

Return period: 2906.4902 yrs
Exceedance rate: 0.00034405758 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.08 %

Mean (over all sources)

m: 6.95
r: 11.49 km
ε_0: 1.33 σ

Mode (largest m-r bin)

m: 7.7
r: 12.33 km
ε_0: 0.94 σ
Contribution: 14.91 %

Mode (largest m-r-ε_0 bin)

m: 7.7
r: 11.69 km
ε_0: 0.7 σ
Contribution: 9.1 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM32	System							38.51
Simi-Santa Rosa [6]		5.83	6.98	1.02	119.102°W	34.222°N	341.52	11.43
Oak Ridge (Onshore) [0]		11.25	7.37	0.99	119.125°W	34.269°N	339.69	8.17
Oak Ridge (Onshore) [1]		12.44	7.55	0.94	119.113°W	34.285°N	347.04	4.32
Malibu Coast (Extension) alt 2 [2]		12.44	7.56	1.05	119.093°W	34.064°N	184.29	2.79
Ventura-Pitas Point [2]		16.23	7.48	1.64	119.186°W	34.292°N	323.71	2.20
Anacapa-Dume alt 2 [6]		15.91	7.37	1.45	119.084°W	33.983°N	180.36	1.82
Oak Ridge (Offshore) [5]		18.04	6.91	1.97	119.273°W	34.240°N	292.25	1.74
UC33brAvg_FM31	System							38.31
Simi-Santa Rosa [6]		5.83	7.01	1.01	119.102°W	34.222°N	341.52	12.36
Oak Ridge (Onshore) [0]		11.25	7.45	0.93	119.125°W	34.269°N	339.69	8.67
Oak Ridge (Onshore) [1]		12.44	7.65	0.86	119.113°W	34.285°N	347.04	4.19
Ventura-Pitas Point [2]		16.23	7.46	1.67	119.186°W	34.292°N	323.71	2.57
Malibu Coast (Extension) alt 1 [4]		12.45	7.29	1.30	119.099°W	34.062°N	186.75	2.00
Anacapa-Dume alt 1 [3]		16.08	7.45	1.26	119.090°W	33.986°N	181.68	1.57
UC33brAvg_FM31 (opt)	Grid							11.64
PointSourceFinite: -119.083, 34.207		6.14	5.69	1.42	119.083°W	34.207°N	0.00	2.26
PointSourceFinite: -119.083, 34.207		6.14	5.69	1.42	119.083°W	34.207°N	0.00	2.26
PointSourceFinite: -119.083, 34.252		9.22	5.83	1.83	119.083°W	34.252°N	0.00	1.63
PointSourceFinite: -119.083, 34.252		9.22	5.83	1.83	119.083°W	34.252°N	0.00	1.63
UC33brAvg_FM32 (opt)	Grid							11.54
PointSourceFinite: -119.083, 34.207		6.14	5.69	1.42	119.083°W	34.207°N	0.00	2.27
PointSourceFinite: -119.083, 34.207		6.14	5.69	1.42	119.083°W	34.207°N	0.00	2.27
PointSourceFinite: -119.083, 34.252		9.21	5.83	1.83	119.083°W	34.252°N	0.00	1.63
PointSourceFinite: -119.083, 34.252		9.21	5.83	1.83	119.083°W	34.252°N	0.00	1.63

Appendix E

Hydraulic Modeling Technical Memorandum
MKN & Associates

TECHNICAL MEMORANDUM

To: Jared Borchard, Pleasant Valley County Water District

From: Ryan Gallagher, PE, MKN
Cindy Sevilla Esparza, EIT, MKN

Date: December 22, 2022

Re: Task Group 4 - Water Model Technical Memorandum

Section 1 – Background and Introduction

As a member of Fox Canyon Groundwater Management Agency (FCGMA), Pleasant Valley County Water District (PVCWD) pursued and acquired a Sustainable Groundwater Management Act (SGMA) Implementation Grant to assist with the financing of the Pleasant Valley Basin (PVB) Implementation Project as detailed in FCGMA's Groundwater Sustainability Plan (GSP).

Supply enters the PVCWD system from two wholesale sources: United Water Conservation District (UWCD) and Camrosa Water District (CWD). UWCD has access to surface water in the Santa Clara River Watershed via the Freeman Diversion and CWD has access to surface water in the Calleguas Creek Watershed via the Conejo Creek Diversion. PVCWD also pumps groundwater from the Pleasant Valley Basin and Oxnard Basin through 11 wells and receives recycled water from the City of Oxnard (City) for irrigation. PVCWD provides irrigation water to farmlands within their service area.

A lack of storage and insufficient conveyance capacity within the PVCWD distribution system due to a bottle neck in the current pipe configuration are known limitations. These constraints limit the ability to harvest additional Conejo Creek flows and City recycled water. Additionally, the lack of conveyance capacity prevents PVCWD from adequately conveying excess flows to a future connection to UWCD's Pumping Trough Pipeline (PTP) system. To maximize the use of both the City's recycled water and the Conejo Creek water, both within the District's service area and adjacent UWCD's PTP system, a new pipeline in Laguna Road is required to be constructed. The new Laguna Road Pipeline will connect large diameter pipelines located within Wood Road and Las Posas Road.

PVCWD retained MKN & Associates, Inc. (MKN) to design the new pipeline and construct a hydraulic model of the PVCWD system to confirm the pipeline sizing. A water system hydraulic model is an engineering tool used for calculating the hydraulic capacity of a water system under various loadings and boundary conditions. The PVCWD water model is a computer representation of the PVCWD water system including pipelines, wells, booster pumps, reservoirs, customer turnouts, control valves, and interties with wholesalers.

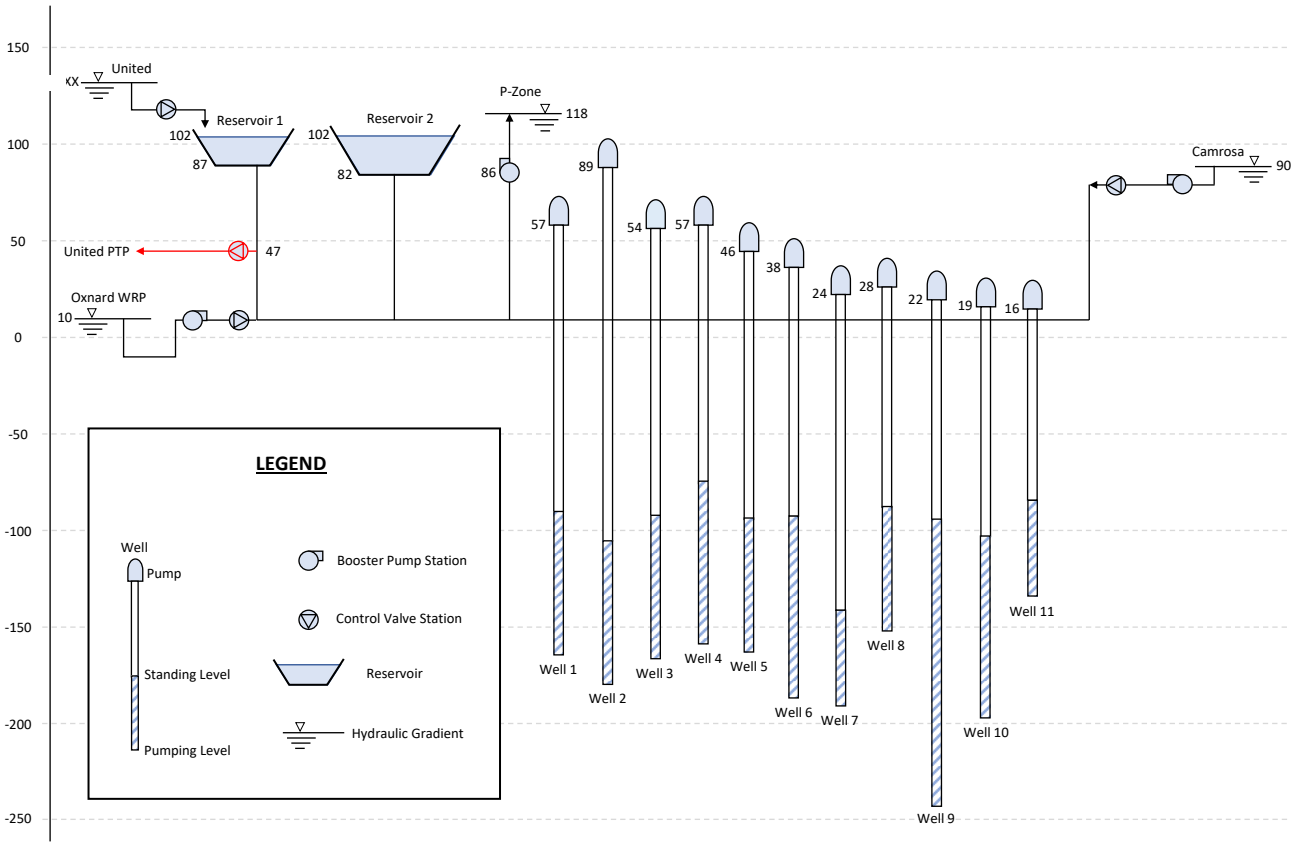
The hydraulic model has been constructed and calibrated per existing conditions. The proposed Laguna Road Pipeline will be integrated into the hydraulic model, and a series of simulations will be conducted to verify its capacity and functionality. These simulations represent the future uses of the new infrastructure. Once the capacity and functionality of new infrastructure is verified, the hydraulic model can be used to develop parameters for operational control of new and existing facilities.

Section 2 – Model Construction

Prior to model construction, MKN developed a geographic information system (GIS) map of the PVCWD system. The GIS map includes locations and attributes of the PVCWD pipelines, wells, booster pumps, reservoirs, customer turnouts, control valves, and interties with wholesalers. PVCWD provided Google Earth, KMZ files for customer turnouts, valves, and wells. Pipeline data was retrieved from Ventura County online GIS portal and PVCWD's as-builts. Elevations, pipeline characteristics (length, diameter, and material), valves, and approximate distances were verified with PVCWD's as-builts. Elevations not included in PVCWD's as-builts were determined using publicly available elevation data. Storage facilities, connections to other agencies, and reservoirs are also noted on the map. Atlas sheets illustrating the PVCWD system can be found in **Appendix A.**

PVCWD reviewed the GIS mapping and commented on facility locations and missing assets. All comments were incorporated in the final GIS map. MKN utilized the GIS map to develop an InfoWater (Version 12.4) hydraulic model. The hydraulic model was configured using the water system information (reservoir levels and pump curves) provided by PVCWD and neighboring agencies. PVCWD's major facilities and their hydraulic relationship with the system are shown in **Figure 2-1**.

Figure *2-1* – PVCWD Water System Schematic



Storage

PVCWD has one site with two reservoirs with a total estimated capacity of 280 acre-feet (AF). The reservoirs are hydraulically linked and function in tandem to establish the hydraulic gradient of the system. Reservoir 1 has a base elevation of 87 feet, a maximum depth of 15.5 feet, and a capacity of 95 AF at the maximum depth. Reservoir 2 has a base elevation of 82 feet, a maximum depth of 20.5 feet, and a capacity of 188 AF at the maximum depth. For modeling purposes, a single reservoir with an equivalent geometry was added to the hydraulic model.

Table 2-1 provides a summary of storage capacity relative to water surface elevation and reservoir depth. The individual reservoir geometries are included in **Appendix B** as both million gallons (MG) and AF.

Table 2-1 – Existing Reservoir Capacity

Elevation	Reservoir 1			Reservoir 2			Combined	
	Depth	Volume (MG)	Volume (AF)	Depth	Volume (MG)	Volume (AF)	Volume (MG)	Volume (AF)
82				0	0	0	0.00	0.00
83				1	2.51	7.70	2.51	7.70
84				2	5.06	15.54	5.06	15.54
85				3	7.67	23.53	7.67	23.53
86				4	10.32	31.67	10.32	31.67
87	0	0	0	5	13.02	39.95	13.02	39.95
88	1	1.71	5.25	6	15.77	48.39	17.48	53.64
89	2	3.46	10.62	7	18.57	56.98	22.03	67.59
90	3	5.25	16.10	8	21.42	65.72	26.66	81.81
91	4	7.07	21.69	9	24.31	74.61	31.38	96.30
92	5	8.93	27.40	10	27.26	83.66	36.19	111.06
93	6	10.83	33.22	11	30.26	92.86	41.09	126.08
94	7	12.76	39.16	12	33.31	102.22	46.07	141.39
95	8	14.74	45.22	13	36.41	111.74	51.15	156.97
96	9	16.75	51.40	14	39.57	121.42	56.32	172.83
97	10	18.80	57.70	15	42.77	131.26	61.58	188.97
98	11	20.90	64.13	16	46.03	141.26	66.93	205.39
99	12	23.03	70.68	17	49.35	151.43	72.38	222.10
100	13	25.21	77.35	18	52.71	161.75	77.92	239.10
101	14	27.42	84.15	19	56.13	172.25	83.55	256.39
102	15	29.68	91.07	20	59.60	182.91	89.28	273.98
102.5	15.5	30.83	94.60	20.5	61.37	188.32	92.19	282.91

Wells

There are eleven operational wells in the PVCWD system. Wells 1, 2, 4, 5, 6, and 8 draw from the Pleasant Valley Basin and Wells 3, 7, 9, 10 and 11 draw from the Oxnard Basin.

The following hydraulic parameters were used to model each well:

- Reservoir: A reservoir represents an element with an unlimited volume, opposed to a tank which has a finite volume. The reservoir in this case represents the aquifer from which the well pumps from. This parameter represents the pumping level when the well is active. It is programmed as a fixed water surface.

- Pipe: This parameter represents the well shaft between the elevation of the pump impellers and the surface. It is programmed as a pipe with a length, diameter, and roughness coefficient.

- Pump: This parameter represents increasing the hydraulic head between the reservoir and the discharge to the system. A pump is programmed as a node with an elevation (the elevation of the pump discharge) and a pump curve. Manufacturer pump curves were available for Wells 1, 5, 8 and 11 (See **Appendix C**). For the remaining wells, a design point curve with design head and design flow were incorporated.

Pipelines

Pipeline locations were incorporated from as-built drawings into GIS and transferred spatially in the hydraulic model. In the hydraulic model, pipelines were broken into segments to include information on isolation valves, customer turnouts, wells, and other appurtenances.

Each pipeline was assigned an alignment, a length and a diameter per the as-builts. A roughness coefficient was assigned per American Water Works Association (AWWA) standards for similar pipe materials. **Table 2-2** summarizes the Hazen-Williams Pipe Roughness Factors used in the hydraulic model.

Table 2-2 – Hazen-Williams Pipe Roughness Factor

Pipe Material	C Factor
PCP	140
PVC	150
ACP	140

At the end of each pipe is a node. A node may function as a connection between pipes, the terminus of a dead-end, a pump, a valve, a reservoir, or a tank. Each node was assigned an elevation based on publicly available elevation data and the function/description of each node was included in the hydraulic model's informational database.

An 18-inch, 20-inch, and 24-inch diameter pipeline was assessed in the hydraulic model to size the Laguna Road Pipeline. The material for the Laguna Road Pipeline was assumed to be PVC.

United Water Conservation District (UWCD) Interconnection

Wholesale supply from UWCD fills Reservoir 1 and Reservoir 2 via an air gap. Supply is regulated by a flow control valve. Modeling the UWCD Intertie requires the following hydraulic parameters:

- Reservoir: A reservoir represents an element with an unlimited volume, opposed to a tank which has a finite volume. This parameter represents the hydraulic head in the UWCD system upstream of the reservoirs. It is programmed as a fixed water surface.

- Pipe: This parameter represents the transmission pipeline between the UWCD control valve and the reservoirs. It is programmed as a pipe with a length, diameter, and roughness coefficient.

- Flow Control Valve: This parameter represents the drop in hydraulic head between the UWCD system and the reservoirs at an operational flow rate specified for the control valve. It is programmed as a flow control valve with an elevation and flow setting.

The proposed future connection to UWCD's PTP system was modeled as a junction with a negative demand to simulate a delivery from PVCWD to the PTP system. The junction is located on the corner of Laguna Road and Wood Road. The node was assigned a demand of either 2,000 gpm and 6,000 gpm. Multiple flows were tested to ensure the Laguna Road Pipeline is sized adequately. The demands were used in different scenarios as described in **Section 6**.

Oxnard Advanced Water Purification Facility (AWPF) Interconnection

Wholesale supply from the Oxnard Advanced Water Purification Facility (AWPF) enters the southwest corner of the PVCWD system at the intersection of Wood Road and Hueneme Road. The Hueneme Road Recycled Water Pipeline, which conveys flow from the Oxnard AWPF to the PVCWD system, was incorporated into the hydraulic model from as-built drawings.

Modeling the Oxnard AWPF and Oxnard connection requires the following hydraulic parameters:

- Reservoir: This parameter represents the hydraulic head in the Oxnard system upstream of the intertie. It is programmed as a fixed water surface.

- Pipe: This parameter represents the transmission pipeline between the Oxnard pressure control valve and the PVCWD system. It is programmed as a pipe with a length, diameter, and roughness coefficient.

- Pressure Reducing Valve: This parameter represents a limitation in the downstream pressure from the Oxnard connection. The pressure reducing valve is located on the corner of Wood Road and Hueneme Road and was set to 50 pound per square inch (psi).

- Pump: This parameter represents increasing the hydraulic head between the reservoir and the discharge to the system. A pump is programmed as a node with an elevation (the elevation of the pump discharge) and a pump curve. The Oxnard AWPF was set up with three pumps in parallel (two pumps on and one pump off). Pump curves are included in **Appendix C**.

Camrosa Water District Interconnection

CWD provides surface water diverted from Conejo Creek and recycled water received from the City of Camarillo and Camrosa Water Reclamation Facility. Wholesale supply from CWD enters the east side of the PVCWD system.

Modeling the CWD Intertie requires the following hydraulic parameters:

- Reservoir: This parameter represents the hydraulic head in the CWD system upstream of the intertie. It is programmed as a fixed water surface.
- Pipe: This parameter represents the transmission pipeline between the CWD control valve and the PVCWD system. It is programmed as a pipe with a length, diameter, and roughness coefficient.
- Pump: This parameter represents increasing the hydraulic head between the reservoir and the discharge to the system. CWD was set up with three pumps in parallel. Pump curves were not available. A design point curve with a design flow of 2,150 gpm and design head of 125 feet was used for each of the pumps.

Section 3 – Loading Allocation

With the hydraulic model developed with PVCWD infrastructure, the hydraulic model was loaded with demand and supply elements. This section summarizes the assumptions and sources of data utilized for this process.

Wells

PVCWD's system receives groundwater from 11 PVCWD owned wells, which were installed in the late 1970s and early 1980s. **Table 3-1** provides a summary of historical well production flow rates based on data provided by PVCWD.

Table 3-1 – Historical Production Flow Rate

Well No.	Low Flow (gpm)	High Flow (gpm)	Average Flow (gpm)	Recent Upgrade
1	1,750	2,000	1,850	Yes
2	2,050	2,250	2,150	-
3	1,000	1,450	1,200	-
4	1,500	2,000	1,750	-
5	1,250	1,400	1,300	Yes
6	1,100	1,500	1,300	-
7	1,500	1,800	1,700	-
8	1,200	1,600	1,400	-
9	1,200	1,450	1,350	-
10	1,800	1,900	1,850	Yes
11	2,300	2,400	2,350	Yes

The standing level is the average of monthly sounding data for calendar years 2018 and 2019. The pumping level is the standing level less drawdown per recent pump efficiency testing. **Table 3-2** provides a summary of recent pump efficiency test data for the wells.

Table 3-2 – Pump Test Data Summary

Well	Flow (gpm)	Head (feet)	Elevation (feet)	Standing Level (feet)	Pumping Level (feet)	Horsepower	Test Date
1	1,248	278	57	-98	-178	200	8/1/2018
2	2,219	276	89	-107	-179	200	7/16/2018
3	1,102	306	54	-106	-172	200	10/16/2017
4	1,981	263	57	-79	-159	200	6/16/2017
5	1,562	273	46	-100	-172	150	7/24/2018
6	1,123	334	38	-97	-189	200	9/6/2017
7	1,640	275	24	-142	-189	200	3/4/2022
8	1,571	250	28	-91	-156	200	7/16/2018
9	1,447	373	22	-100	-251	200	9/24/2018
10	1,590	336	19	-99	-195	200	9/6/2017
11	2,490	241	16	-87	-137	200	3/4/2022

Well 1 was recently rehabilitated and an efficiency test has not been conducted since rehabilitation. A 150 HP submersible pump was recently installed at Well 5. An efficiency test has not been conducted since installation. Pump curves were available for Wells 1, 5, 8 and 11, and are included in **Appendix C**. The flow and head included in **Table 3-2** was used to assign an appropriate design performance curve to each pump without a manufacturer pump curve.

United Water Conservation District (UWCD)

Wholesale supply from United Water Conservation District (UWCD) fills Reservoir 1 and Reservoir 2 via an air gap. UWCD's diversion water is from the Freeman Diversion. Per XiO data from August 2019 to 2022, flow from UWCD to the Reservoirs varied from zero to about 39,000 gpm.

UWCD's PTP connection will tie into the PVCWD system through an 18-inch pipe to the west along Laguna Road. This portion of the pipeline will be operated by UWCD and will include a control facility that ensures proper flows. The Laguna Road Pipeline will provide hydraulic capacity to deliver CWD or Oxnard AWPF flows more efficiently to UWCD.

Camrosa Water District (CWD)

CWD provides surface water diverted from Conejo Creek and recycled water received from the City of Camarillo and Camrosa Water Reclamation Facility. Wholesale supply from CWD enters the east side of the PVCWD system located near S. Lewis Road and Old Lewis Road. Per XiO data, flow from CWD varied from zero to about 8,000 gpm.

Oxnard Advanced Water Purification Facility (AWPF)

The Oxnard AWPF was constructed in 2014 and treats wastewater to recycled water standards. The City constructed a connection near the intersection of Wood Road and Hueneme Road to supply water from Oxnard's AWPF. As described in the Oxnard AWPF- Finish Water Pump Station Control Technical Memorandum (CH2M Hill, 2008), the AWPF has two separate pump sets operating in the finish water wet well. One pump set serves

as the primary control (Backbone) and the other serves as the secondary control (Oceanview). The pump curves for both sets of pumps are included in **Appendix C**. For the purposes of the hydraulic model, the Oceanview pump set was utilized.

Demand Analysis

Monthly production totals, monthly billing and XiO telemetry were reviewed. XiO data was used to create a demand model per the following relationship:

$$Q = Q_{in} - Q_{out} - \frac{\Delta V}{\Delta t}$$

Where:

Q is demand

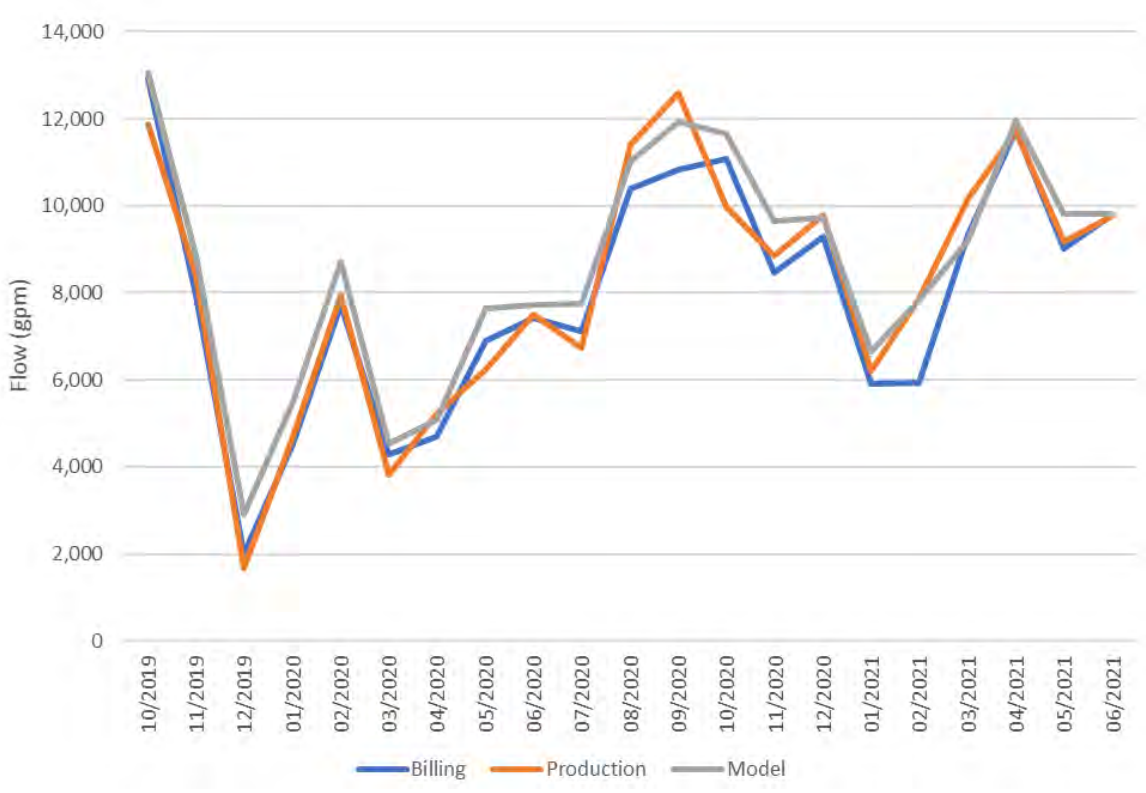
Q_{in} is the sum of production

Q_{out} is wholesale water leaving the system (assumed to be zero)

$\frac{\Delta V}{\Delta t}$ is flow in and out of the reservoirs

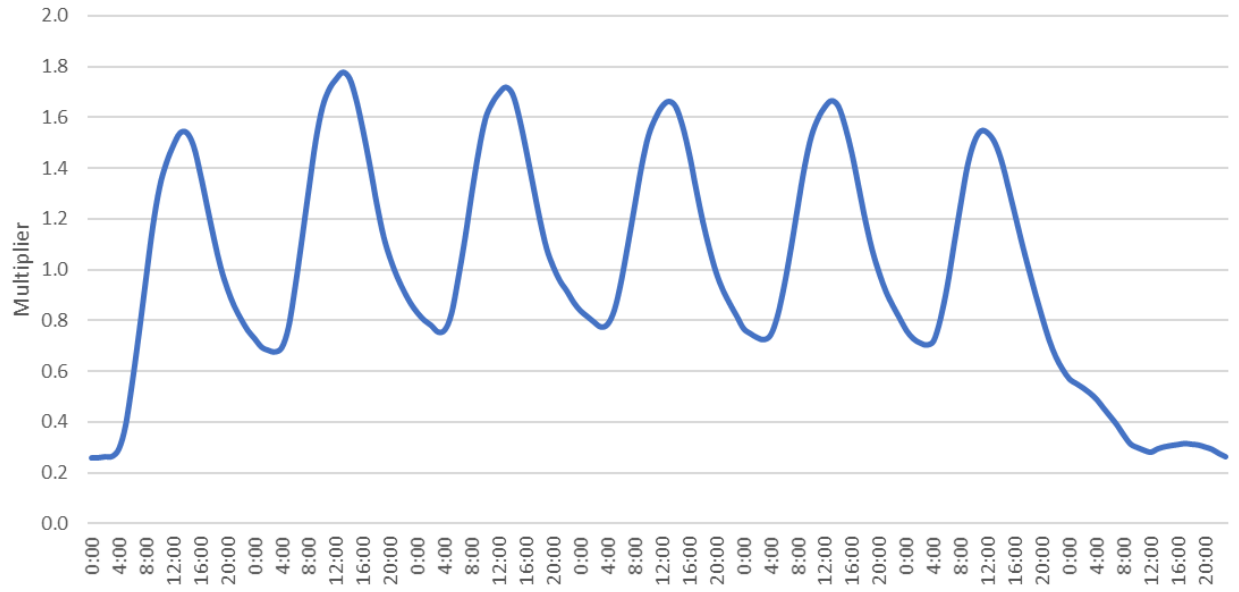
The most complete dataset is for the period October 2019 through June 2021. For comparison, billing, production, and demand model data were converted to average monthly flow in gallons per minute. During this period the three datasets are well correlated, as shown in **Figure 3-1**.

Figure 3-1 – Production, Billing, and XiO Data Correlation



Billing is 2.7% lower than production, which suggests water loss is 2.7%. The demand model is 5.6% higher than production. This value is well correlated and slightly conservative. During dry weather, demand variation was found to follow a consistent weekly pattern shown in **Figure 3-2**.

Figure 3-2 – Weekly Dry Weather Demand Variation



Maximum and minimum demands were used for the modeling process to represent winter and summer demands. As shown in **Figure 3-2**, the minimum demand multiplier is approximately 0.25 and the maximum demand multiplier is 1.8.

Customer Turnouts

There are 112 customer turnouts. The average week, maximum week, and intensity of demand at each turnout with respect to weekly demand is shown in **Appendix D**.

Section 4 – Model Calibration

The hydraulic model calibration process ensures the hydraulic model accurately represents field conditions. The following section describes the calibration process.

Steady State Calibration

PVCWD uses XiO, which serves as a could-based supervisory control and data acquisition (SCADA) system for facilities, to monitor all well and reservoir information. Hourly flow data from PVCWD's XiO system was observed from March 5, 2022 to March 13, 2022. The steady state calibration is a result of a 215-hour study. XiO data from PVCWD's wells, reservoirs, UWCD, as well as Oxnard data was reviewed to determine typical flow rates. Well performance varies according to standing aquifer level, drawdown, specific capacity of the aquifer in conjunction with pumping duration, influence of other wells, efficiency of the well facility, and capacity of the water system.

Manufacturer pump curves were available for Well 1, 5, 8 and 11. For pumps that did not have manufacturer pump curves available, the design flow and design head included in **Table 3-2** (Section 3) provided an initial flow and head for a design point curve. The flow and head were adjusted until the average pump performance mimicked typical pumping levels.

The goal of the calibration process is to achieve a tolerance of at least ±10 psi or 10% of flow at all locations. **Table 4-1** summarizes the design flow and design head for each well and the percent difference between the hydraulic model output and XiO data.

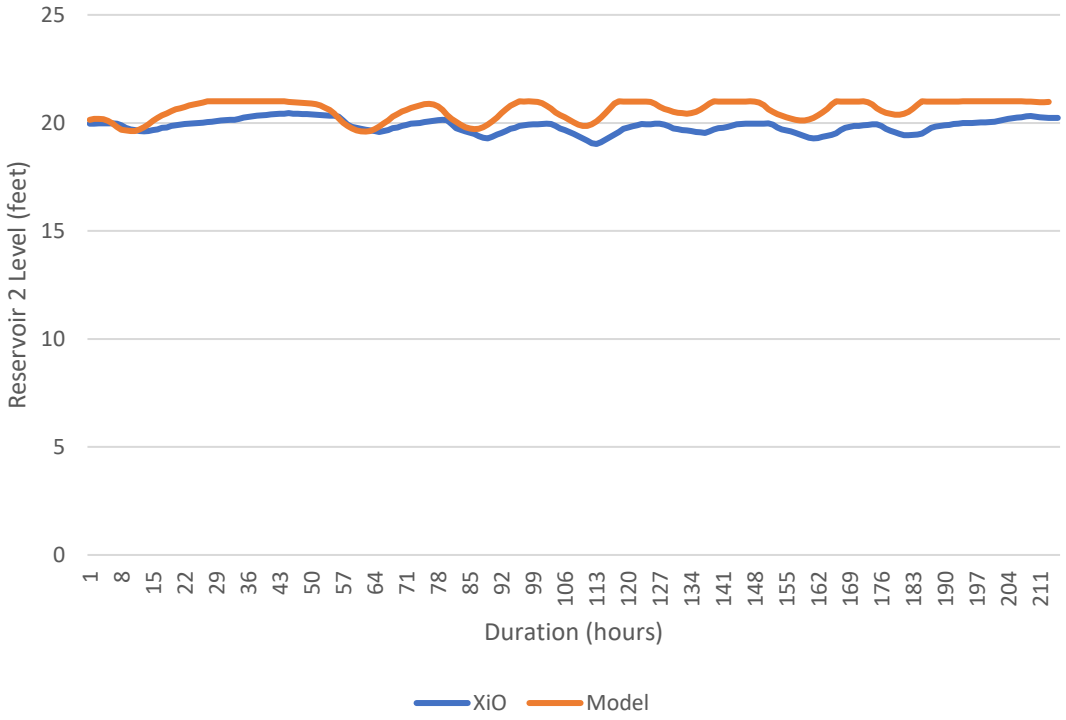
Table 4-1 – Calibration Results

Facility	Flow (gpm)	Head (feet)	Model/XiO Flow Percent Difference	Model/XiO Pressure Difference (psi)
Well 2	1,553	442	1.3%	0.7
Well 3	950	500	0.9%	2.9
Well 4	1,300	375	1.4%	0.6
Well 6	936	590	0.7%	2.3
Well 7	1,312	413	1.6%	6.3
Well 9	1,158	560	Off During Calibration	3.2
Well 10	1,250	540	0.5%	3.3
CWD Pumps	2,150	125	8.7%	-

Notes: During this period, Well 5, 8, and 9 were not in service.

In addition to calibrating the pumps, the reservoir level was also calibrated. The initial reservoir level was set to 19 feet in Reservoir 2, which equates to a level of 14 feet in Reservoir 1. The average percent difference over the 215-hour run simulation is 3.7%. **Figure 4-1** shows the variation between XiO and model reservoir.

Figure 4-1 – PVCWD Reservoir Levels During Calibration Period



Section 5 – Scenario Development

The goal of modeling each scenario was to assess the system's performance under extreme conditions. The scenarios include multiple combinations of each supply source occurring at maximum or minimum conditions. The scenarios were developed with input from PVCWD staff.

The supply sources, which varied among scenarios, include the PVCWD wells, UWCD PTP, CWD, and Oxnard AWPF. All scenarios were ran with various wells in service (from all to none), and each version was ran twice to show results under the system's current conditions and results with the addition of the Laguna Road Pipeline. The latter was done to quantify the impact of the new pipeline on Oxnard AWPF supply and confirm the estimated flow through the new pipeline.

The initial reservoir level in all scenarios was 12 feet (as measured at Reservoir 2) and customer demand was set to 1,824 gpm, consistent with winter demands. The low demand period was selected as it presents a conservative assumption as Oxnard AWPF supply would be increased if system demand was high near the connection. In addition, Oxnard AWPF supply during the winter reflects a more realistic scenario as Oxnard AWPF water will be more readily available when irrigation demand is low in the Oxnard recycled water distribution system. The Oxnard AWPF Oceanview pump curve was used in all scenarios and the Oxnard PRV was set to 50 psi in all scenarios. The following summarizes the variations in each scenario:

- **Scenario A:** no flow from CWD, and no demand from the UWCD PTP
- **Scenario B:** no flow from CWD, and varying demand from the UWCD PTP
- **Scenario C:** maximum flow from CWD, and varying demand from the UWCD PTP

Section 6 – Model Simulation

Nodes and pipes at different elevations of the system, near major supply connections, and adjacent to the proposed Laguna Road pipeline were analyzed to determine pressure and velocity changes. An 18-inch diameter PVC pipeline was assessed in the hydraulic model. The following design criteria was used in the analysis:

- Junction Pressure (minimum): 20 psi
- Pipeline Velocity (maximum): 5 feet per second (fps)

As noted in Section 5, the supply sources varied for each scenario. In Scenario A, the only supply sources are the wells. The analysis begins showing all wells on in the system. Each iteration turns off one well in the system. The final iteration shows no wells on in the system. Once Well 7, Well 8, and Well 11 are turned off, turning off the remaining wells does not change in flow from the Oxnard AWPF or the flow in the pipeline significantly. The results from those remaining trials are not included in the results. Each iteration was conducted under the system's current conditions (Trial A) and with the addition of the Laguna Road Pipeline (Trial B). **Table 6-1** summarizes the results of each trial.

Table 6-1 – Scenario A Results

Trial	Supply Flow	Oxnard PRV Flow (gpm)	Oxnard PRV Pressure (psi)	Pipeline Flow (gpm)	Pipeline Velocity (fps)	UWCD Pressure (psi)
1A	All Wells On	805	50	-	-	43
1B	All Wells On	1,286	50	1,093	1.4	42
2A	All Wells On Except 11	2,892	50	-	-	42
2B	All Wells On Except 11	3,232	50	920	1.2	41
3A	All Wells On Except 11, 8	2,917	50	-	-	42
3B	All Wells On Except 11, 8	3,293	49	1,441	1.8	41
4A	All Wells On Except 11, 8, 7	3,320	49	-	-	40
4B	All Wells On Except 11, 8, 7	3,397	48	910	1.2	39
5A	All Wells Off	3,383	49	-	-	40
5B	All Wells Off	3,459	48	1,005	1.3	39

NOTES:
1. Trial No. A: Analysis with no upgrades in the system
2. Trial No. B: Analysis with the addition of the Laguna Road Pipeline
3. Scenario A does not analyze the effect from CWD flow
4. Scenario A does not analyze the effect of supply from UCWD PTP
5. Pipeline diameter assumed to be 18-inches

The addition of the Laguna Road Pipeline results in additional Oxnard AWPF flow entering the system. Although the maximum capacity of the Oxnard AWPF is 4,340 gpm (6.25 MGD), field observations noted by PVCWD staff showed the average flow delivered to be 3,000-3,200 gpm and the pressure at the PRV at 50-55 psi. Scenario A results are consistent with these findings.

The difference in Oxnard AWPF flow is greatest when turning off Wells 11, 7 and 8. This is expected since these wells are closest in proximity to the Oxnard AWPF PRV and the Laguna Road Pipeline. As mentioned previously turning off additional wells after Wells 7, 8 and 11 are off yields minimum change to Oxnard AWPF flow or pipeline flow. Turning off the remaining 8 wells yielded an increase of approximately 35 gpm.

The maximum flow and velocity of the proposed Laguna Beach Pipeline in Scenario A is 1,441 gpm and 1.8 fps, respectively. The pressure at the UWCD PTP proposed connection does not exceed 43 psi. All parameters meet the specified design criteria. Due to the pipe flow and velocity consistently meeting design criteria, larger pipe diameters were not tested.

Scenario B is similar to Scenario A with the exception that UWCD PTP demand is included. Demand at the UWCD PTP was varied between 2,000 gpm and 6,000 gpm. As mentioned in the discussion for Scenario A, only trials excluding Well 7, Well 8 and Well 11 are included. **Table 6-2** summarizes the results of the Scenario B model evaluation.

Table 6-2 – Scenario B Results

Trial	Supply Flow	UCWD PTP (gpm)	Oxnard PRV Flow (gpm)	Oxnard PRV Pressure (psi)	Pipeline Flow (gpm)	Pipeline Velocity (fps)	UWCD Pressure (psi)
1A	All Wells On	2,000	1,654	50	-	-	44
1B	All Wells On	2,000	1,840	50	545	0.7	40
2A	All Wells On	6,000	2,553	50	-	-	38
2B	All Wells On	6,000	2,668	50	795	1.0	39
3A	All Wells On Except 11, 8, 7	2,000	3,399	50	-	-	39
3B	All Wells On Except 11, 8, 7	2,000	3,492	50	831	1.0	39
4A	All Wells On Except 11, 8, 7	6,000	3,554	50	-	-	38
4B	All Wells On Except 11, 8, 7	6,000	3,621	50	1,110	1.4	38
5A	All Wells Off	2,000	805	50	-	-	44
5B	All Wells Off	2,000	2,081	50	395	0.5	38
6A	All Wells Off	6,000	2,583	50	-	-	43
6B	All Wells Off	6,000	3,225	50	2,065	2.6	41

NOTES:
1. Trial No. A: Analysis with no upgrades in the system
2. Trial No. B: Analysis with the addition of the Laguna Road Pipeline
3. Scenario B does not analyze the effect from CWD flow
4. Pipeline diameter assumed to be 18-inches

Similar to the Scenario A results, the addition of the Laguna Road Pipeline yields an increase in flow from the Oxnard AWPF. The increase in flow ranges from 70 gpm to 190 gpm in Scenarios 1 through 4, where all or a portion of the wells are online. When all wells in the system are offline, the addition of the Laguna Road Pipeline increases flow from the Oxnard AWPF by 640 gpm to 1,280 gpm.

The maximum flow in the Laguna Road Pipeline occurs when all wells are offline with UCWD PTP at 6,000 gpm. The pipe flow is 2,065 gpm and the velocity is 2.6 fps. All parameters meet the specified design criteria.

Scenario C is similar to Scenario B with the exception that CWD supply is included. Demand at the UWCD PTP was varied between 2,000 gpm and 6,000 gpm. The CWD pump flow varied from 6,000 gpm to 6,200 gpm. **Table 6-3** summarizes the results of each trial.

Table 6-3 – Scenario C Results

Trial	Supply Flow	UCWD PTP (gpm)	CWD Flow (gpm)	Oxnard PRV Flow (gpm)	Oxnard PRV Pressure (psi)	Pipeline Flow (gpm)	Pipeline Velocity (fps)	UWCD Pressure (psi)
1A	All Wells On	2,000	On	1,404	50	-	-	38
1B	All Wells On	2,000	On	1,258	50	387	0.5	38
2A	All Wells On	6,000	On	2,467	50	-	-	35
2B	All Wells On	6,000	On	2,197	50	1,339	1.9	36
3A	All Wells On Except 11, 8, 7	2,000	On	3,308	47	-	-	39
3B	All Wells On Except 11, 8, 7	2,000	On	3,147	47	1,056	1.0	40
4A	All Wells On Except 11, 8, 7	6,000	On	3,571	46	-	-	37
4B	All Wells On Except 11, 8, 7	6,000	On	3,451	46	1,759	2.1	38
5A	All Wells Off	2,000	On	3,504	47	-	-	38
5B	All Wells Off	2,000	On	3,489	47	357	0.5	38
6A	All Wells Off	6,000	On	3,654	46	-	-	36
6B	All Wells Off	6,000	On	3,586	47	1,083	1.4	37

NOTES:
1. Trial No. A: Analysis with no upgrades in the system
2. Trial No. B: Analysis with the addition of the Laguna Road Pipeline
3. Pipeline diameter assumed to be 18-inches

For Scenario C, the addition of the Laguna Road Pipeline does not result in an increase of flow from the Oxnard AWPF, which is contrary to the results observed in both Scenario A and B. The flow from the Oxnard AWPF in Scenario C decreases by about 15 to 270 gpm with the addition of the proposed pipeline.

The inclusion of the pipeline lowers the hydraulic gradient required for CWD supply to serve the southwest portion of the PVCWD system, when compared to Oxnard AWPF deliveries. This could be addressed by increasing the PRV setting at the Oxnard AWPF point of connection or potentially modifying CWD operation. In addition, as limited data is available regarding CWD and Oxnard AWPF operation, additional model refinement with actual pump operating data may reduce or eliminate these findings.

The maximum flow in the Laguna Road Pipeline in Scenario C is 1,759 gpm and the maximum velocity is 2.1 feet per second. All parameters meet the specified design criteria.

Section 7 - Conclusions and Recommendations

Based on the results from the hydraulic modeling, the following conclusions were confirmed:

- **Pipe Size.** An 18-inch PVC pipe is an adequate size to accommodate the intended operation. With a maximum velocity of 2.6 ft/sec observed, this size provides for additional capacity for operational flexibility.
- **Project Increases Hydraulic Capacity.** For both Scenario A and B, Oxnard AWPF flows increased as a result of the new pipeline.
- **Coordination with Well Operation.** Oxnard AWPF flows increased as a result of turning off wells, with Well 11, 8 and 7 having the most significant impact.
- **Maximum Oxnard AWPF Flows.** The hydraulic model demonstrates that Oxnard AWPF flows up to 3,500 gpm are achievable under current assumptions and set points.

With a current capacity of 6.25 MGD the Oxnard AWPF would be anticipated to be capable of achieving sustainable pumping flows up to 4,340 gpm. To achieve these higher flows, the following would need to be further evaluated:

- **Adjusting PRV Setting.** The current setting of 50 psi is intended to protect PVCWD infrastructure. Increasing this set point could be evaluated. Based on preliminary investigations, *increasing this setpoint would allow the full Oxnard AWPF existing capacity to be achieved*.
- **Oxnard AWPF and CWD Pump Operation.** Limited data was available regarding actual set points and pump operation of these two facilities. Further refinement of these operations within the hydraulic model may deliver additional insights and improve accuracy of the results.
- **Field Data and Model Calibration.** The City of Oxnard has not operated the AWPF at the maximum current capacity for various reasons. PVCWD could coordinate an extended test period in which the AWPF would be operated to maximize delivery to PVCWD. The PRV could be adjusted to various points during this period, and field data consisting of flow and pressure recorded. This data could be used to refine the existing hydraulic model.
- **Confirm Existing PVCWD Infrastructure.** PVCWD staff were able to verify valve and meter locations during initial GIS mapping efforts but were unable to verify all pipe information (material and diameters). Future investigations would allow more confidence in the pipeline data in the model.

APPENDIX A

DISTRICT ATLAS MAPS

PLEASANT VALLEY COUNTY WATER DISTRICT • CAMARILLO, CA •

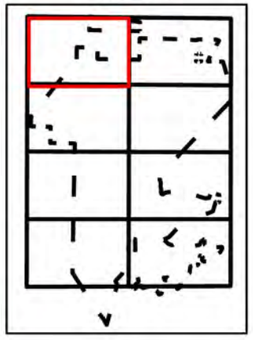
Legend

- Connections
- Wells
- Valves
- Pumping Station
- Turnouts
- Water Lateral Lines

Pipeline Diameter (inches)

- 12
- 14
- 18
- 21
- 24
- 27
- 30
- 33
- 36
- 39
- 42
- 48
- 54
- Storage

Sheet 1



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US Feet

mkn

Legend

- Connections
- Wells
- Valves
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- Turnouts
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Pipeline Diameter (inches)

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- 54
- Storage

Sheet 2

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US Feet

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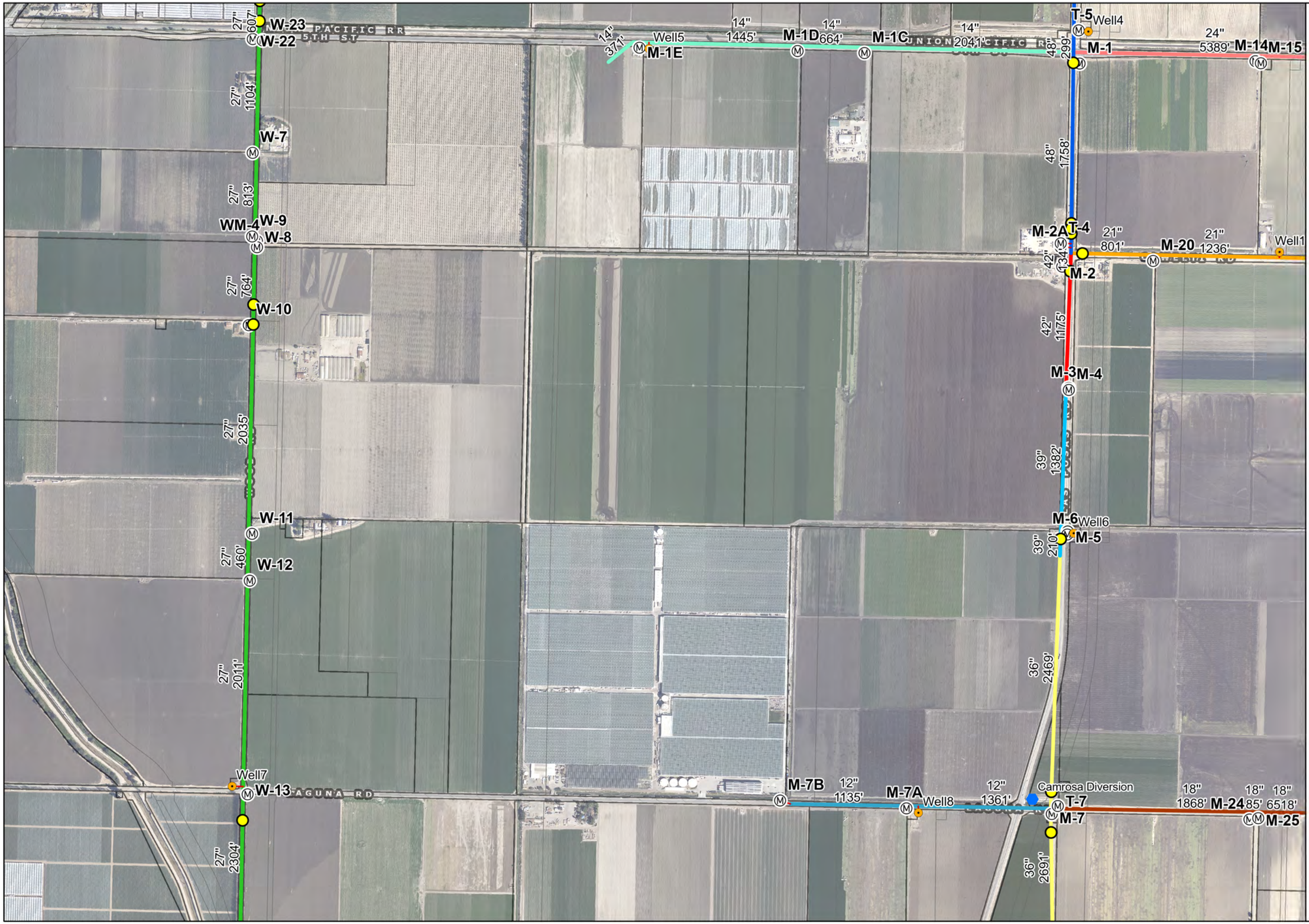

Legend

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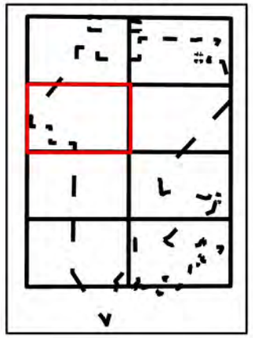
Sheet 3



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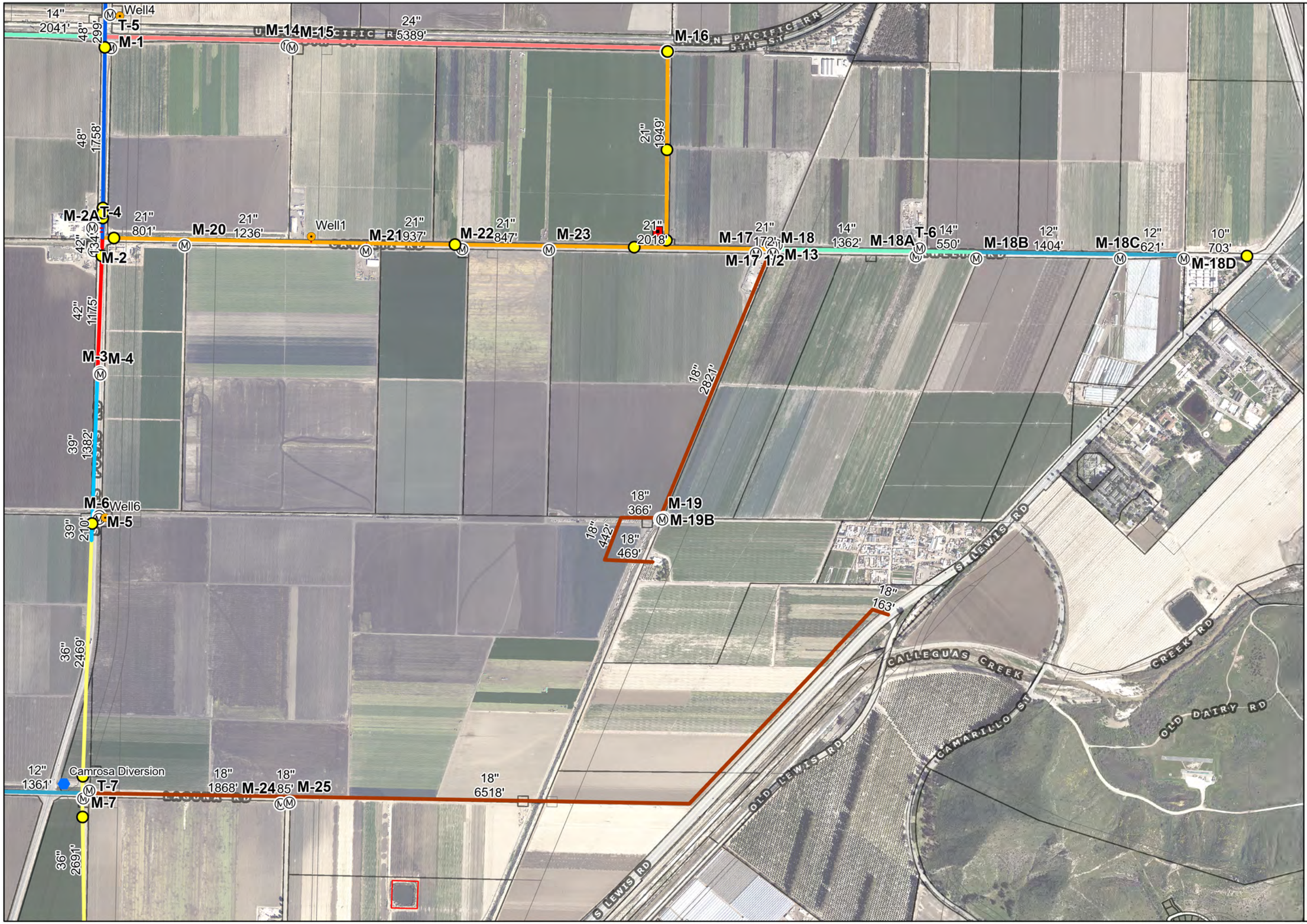

Legend

- Connections
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- Pumping Station
- Turnouts
- Water Lateral Lines

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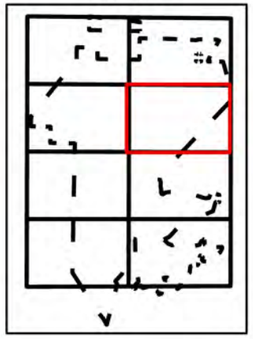
- 54
- Storage

Sheet 4



N

0 500 1,000

US Feet

PLEASANT VALLEY COUNTY WATER DISTRICT • CAMARILLO CA •

Legend

- Connections
- Wells
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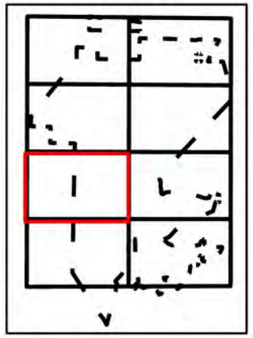
Sheet 5



N

0 500 1,000

US Feet

mkn

PLEASANT VALLEY COUNTY WATER DISTRICT • CAMARILLO CA •

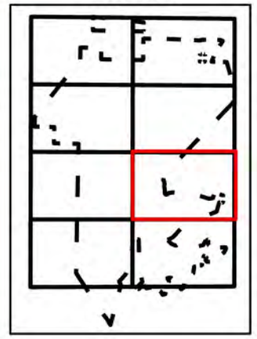
Legend

- Connections
- Wells
- Valves
- Pumping Station
- Turnouts
- Water Lateral Lines

Pipeline Diameter (inches)

- 12
- 14
- 18
- 21
- 24
- 27
- 30
- 33
- 36
- 39
- 42
- 48
- 54
- Storage

Sheet 6



N

0 500 1,000

US Feet

mkn

Oxnard RW Connection
W-16
W-17
W-25
T-2
Well11
W-24
W-18
M-31
M-32A
M-32
24"
5303'
24"
71'
24"
417'
18"
1703'
18"
2175'
12"
1817'
12"
2077'
DUFAU RD
HUENEME RD
RAYTHEON RD
BROOME RD
BROOME RANCH RD
REVOLON SLOUGH
POL RD
MULCAHEY DR
PERIMETER RD
S 1 FW
NAVAL AIR RD
LAS POSAS RD
CALLEGUAS CREEK
REGULUS DR
LOON DR
GORGON DR
SPARROW DR
3RD ST
F AVE
N 1 FW
PLEASANT VALLEY COUNTY WATER DISTRICT
CAMARILLO CA
Legend
Connections
Wells
Valves
Pumping Station
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Pipeline Diameter (inches)
12
14
18
21
24
27
30
33
36
39
42
48
54
Storage
Sheet 7
N
0
500
1,000
US Feet
mkn

PLEASANT VALLEY COUNTY WATER DISTRICT • CAMARILLO CA •

Legend

- Connections
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Pipeline Diameter (inches)

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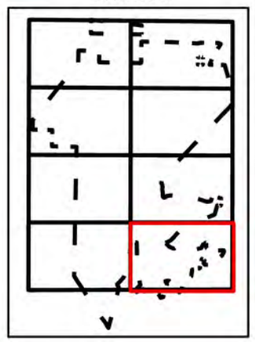
- 42
- 48
- 54
- Storage

Sheet 8



N

0 500 1,000

US Feet

mkn

APPENDIX B

INDIVIDUAL RESERVOIR GEOMETRY

Geometry of Reservoir 1

Depth (feet)	Volume (MG)	Volume (AF)
1	1.71	5.25
2	3.46	10.62
3	5.25	16.10
4	7.07	21.69
5	8.93	27.40
6	10.83	33.22
7	12.76	39.16
8	14.74	45.22
9	16.75	51.40
10	18.80	57.70
11	20.90	64.13
12	23.03	70.68
13	25.21	77.35
14	27.42	84.15
15	29.68	91.07

Geometry of Reservoir 2

Depth (feet)	Volume (MG)	Volume (AF)
1	2.51	7.70
2	5.06	15.54
3	7.67	23.53
4	10.32	31.67
5	13.02	39.95
6	15.77	48.39
7	18.57	56.98
8	21.42	65.72
9	24.31	74.61
10	27.26	83.66
11	30.26	92.86
12	33.31	102.22
13	36.41	111.74
14	39.57	121.42
15	42.77	131.26
16	46.03	141.26
17	49.35	151.43
18	52.71	161.75
19	56.13	172.25
20	59.60	182.91

APPENDIX C

MANUFACTURER PUMP CURVES

Tabular Manufacturer's Pump Performance Curve for Well 1

Flow (gpm)	Head (feet)
0	450
500	430
1,000	405
1,500	365
2,000	325
2,500	260
3,000	150
3,500	0

Tabular Manufacturer's Pump Performance Curve for Well 5

Flow (gpm)	Head (feet)
0	342
200	340
400	336
600	330
800	323
1,000	314
1,200	300
1,600	280
2,000	252
2,400	220
2,800	178
3,200	122
3,600	50
1,200	0

Tabular Manufacturer's Pump Performance Curve for Well 8

Flow (gpm)	Head (feet)
0	408
400	390
800	380
1,200	362
1,600	340
2,000	310
2,400	266
2,800	208
3,200	120
3,600	0

Tabular Manufacturer's Pump Performance Curve for Well 11

Flow (gpm)	Head (feet)
0	408
400	390
800	380
1,200	362
1,600	340
2,000	310
2,400	266
2,800	208
3,200	120
3,600	0

Tabular Manufacturer's Pump Performance Curve for Oxnard WRP's Phase 1 (Low Head) Pumps

Flow (gpm)	Head (feet)
0	216
400	195
800	180
1200	160
1600	147
2000	135
2400	115
2800	90
3200	60
3750	0

Tabular Manufacturer's Pump Performance Curve for Oxnard WRP's Ultimate (High Head) Pumps

Flow (gpm)	Head (feet)
0	689
1,061	584
2,104	490
3,173	445
3,946	377
4,227	343
4,429	307
4,582	261
4,661	233

APPENDIX D

AVERAGE AND MAXIMUM WEEK DEMANDS

Demand Allocation

Turnout	Percentage	Average Week (gpm)	Maximum Week (gpm)
M-0	0.49%	40	81
M-00	0.30%	24	49
M-1	0.00%	0	0
M-1/2	0.00%	0	0
M-10	1.37%	111	226
M-11	1.40%	113	231
M-11A	1.71%	139	282
M-11B	0.86%	70	142
M-12	1.21%	98	200
M-12A	3.97%	321	655
M-12B	7.20%	583	1188
M-13	0.60%	48	98
M-14	0.71%	58	118
M-15	0.63%	51	104
M-16	0.03%	2	5
M-17	0.00%	0	0
M-17 1/2	1.06%	86	175
M-18	1.52%	123	250
M-18A	1.04%	84	172
M-18B	0.58%	47	95
M-18C	0.35%	28	58
M-18D	0.00%	0	0
M-19	1.46%	118	240
M-19A	0.00%	0	0
M-19B	1.71%	138	282
M-1A	1.99%	161	328
M-1B	0.42%	34	70
M-1C	0.76%	61	125
M-1D	0.50%	41	83
M-1E	1.54%	124	253
M-2	0.37%	30	60
M-20	0.87%	70	143
M-21	2.02%	164	334
M-22	1.70%	137	280
M-23	1.00%	81	164
M-24	0.03%	2	4
M-25	0.57%	46	94

Turnout	Percentage	Average Week (gpm)	Maximum Week (gpm)
M-26	0.07%	6	12
M-26A	0.22%	18	37
M-27	1.67%	135	275
M-28	1.28%	103	211
M-29	0.74%	60	123
M-2A	0.30%	24	50
M-3	0.00%	0	0
M-30	0.95%	77	157
M-31	0.46%	37	75
M-32	2.87%	233	474
M-32A	2.69%	218	444
M-33	0.58%	47	95
M-34	1.23%	100	203
M-35	0.54%	44	90
M-4	0.00%	0	0
M-5	1.64%	133	270
M-6	0.00%	0	0
M-7	0.85%	69	141
M-7A	1.85%	150	305
M-7B	0.23%	18	37
M-8	1.55%	125	255
P-1	1.73%	140	285
P-10	0.00%	0	0
P-12	0.11%	9	19
P-13	0.00%	0	0
P-14	0.00%	0	0
P-15	1.05%	85	173
P-16	0.09%	7	14
P-17	1.55%	125	255
P-18	0.04%	3	6
P-19	0.05%	4	8
P-3	0.64%	52	105
P-3B	0.53%	43	87
P-3C	1.53%	124	253
P-4	0.37%	30	61
P-5	0.68%	55	113
P-6	1.80%	145	296
P-8	1.65%	134	272
T-1	0.00%	0	0
T-2	0.05%	4	9

Turnout	Percentage	Average Week (gpm)	Maximum Week (gpm)
T-3	0.02%	2	4
T-5	0.00%	0	0
T-6	0.00%	0	0
T-7	0.04%	3	6
T-8	0.00%	0	0
TPV-1	0.63%	51	104
W-1	0.92%	75	152
W-10	1.73%	140	285
W-11	0.92%	74	151
W-12	0.96%	78	158
W-13	1.52%	123	251
W-14	0.02%	1	3
W-15	0.30%	25	50
W-15A	0.04%	3	7
W-16	0.01%	1	2
W-17	0.04%	3	6
W-18	1.53%	124	253
W-19	0.32%	26	52
W-2	1.52%	123	252
W-20	0.16%	13	26
W-21	0.31%	25	51
W-22	1.90%	154	314
W-23	1.33%	108	219
W-24	4.94%	400	815
W-25	0.00%	0	0
W-26	0.00%	0	0
W-27	0.00%	0	0
W-3	0.81%	66	134
W-4	1.24%	100	204
W-5	0.74%	60	122
W-6	0.95%	77	156
W-7	1.92%	155	317
W-8	1.48%	120	244
W-9	1.41%	114	232
WM-4	0.79%	64	130