Noble Water Storage Tank No. 2 and Transmission Pipeline Project

Environmental Assessment

Project Location
Cherry Valley, Riverside County, California

Permittee:

Beaumont-Cherry Valley Water District
560 Magnolia Avenue
Beaumont, CA 92223

Applicant:

Beaumont-Cherry Valley Water District
560 Magnolia Avenue
Beaumont, CA 92223

Prepared by:

Geovironment Consulting
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June 2023

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Project Information

1. **Project Title:**
   Noble Water Storage Tank No. 2 and Transmission Pipeline

2. **Leady Agency Name and Address:**
   Beaumont-Cherry Valley Water District
   560 Magnolia Avenue
   Beaumont, CA 92223

3. **Contact Person and Phone Number:**
   Mark Swanson, (951) 845-9581

4. **Project Location:**
   The Project site is located approximately 250 feet south of the intersection of International Park Road and Avenue Altura Bella in the Community of Cherry Valley in unincorporated Riverside County. The Project alignment includes portions of the street right of way along International Park Road and Cherry Avenue north of Dutton Street.

5. **Proponent's Name and Address:**
   Beaumont-Cherry Valley Water District
   560 Magnolia Avenue
   Beaumont, CA 92223

6. **General Plan Designation:**
   Open Space Recreation (OS-R)
   Rural Community – Very Low Density Residential

7. **Zoning:**
   Residential Agriculture (R-A-1)
   Controlled Development Areas (W-2)

Summary

The Beaumont Cherry Valley Water District (District) proposes to expand the storage capacity of the existing Noble Zone in order to meet system demands. The existing zone (3040 Zone), supplied by the District's base pressure zone (2750 Zone), has a need for increased storage capacity to satisfy system demands created by near-term development activity. Three Cherry Booster Pumps, 21A, 21B and 21C, located at the 2750 Zone Cherry Reservoir site, pump water from the 2750 Zone to the 3040 Zone. These pumps were probably installed in the late 1960s and early 1970s with the construction of the initial Cherry Reservoirs and Well 211. The existing zone is fed by the existing Noble Water Storage Tank No. 1 as well as the existing Highland Springs tank which each have a storage volume of 1 million gallons (MG). The existing Noble tank is located on International Park Road (APN No. 401-210-010) just south of the Avenida Altura Bella and Cherry Avenue intersection in the Community of Cherry Valley.

Alternative 1 – No Action and Alternative 2 – Proposed Project/Action were analyzed and the District shall determine whether or not to move forward with Alternative 2 – Proposed Project/Action. Both Alternative 1 and Alternative 2 would have no significant impacts to the human environment and surroundings. Alternative 2 would have mitigation measures put in place by project management that would reduce impacts to not significant.

N

0 0.15 0.3 Miles 0.61

Figure 1. Project Vicinity
Noble Tank No. 2 and Transmission Line Project



630 W 7th St
San Jacinto, CA 92583
P. 951.292.5126
www.geovironment.com

N

0 0.03 0.07 0.14 0.2 Miles

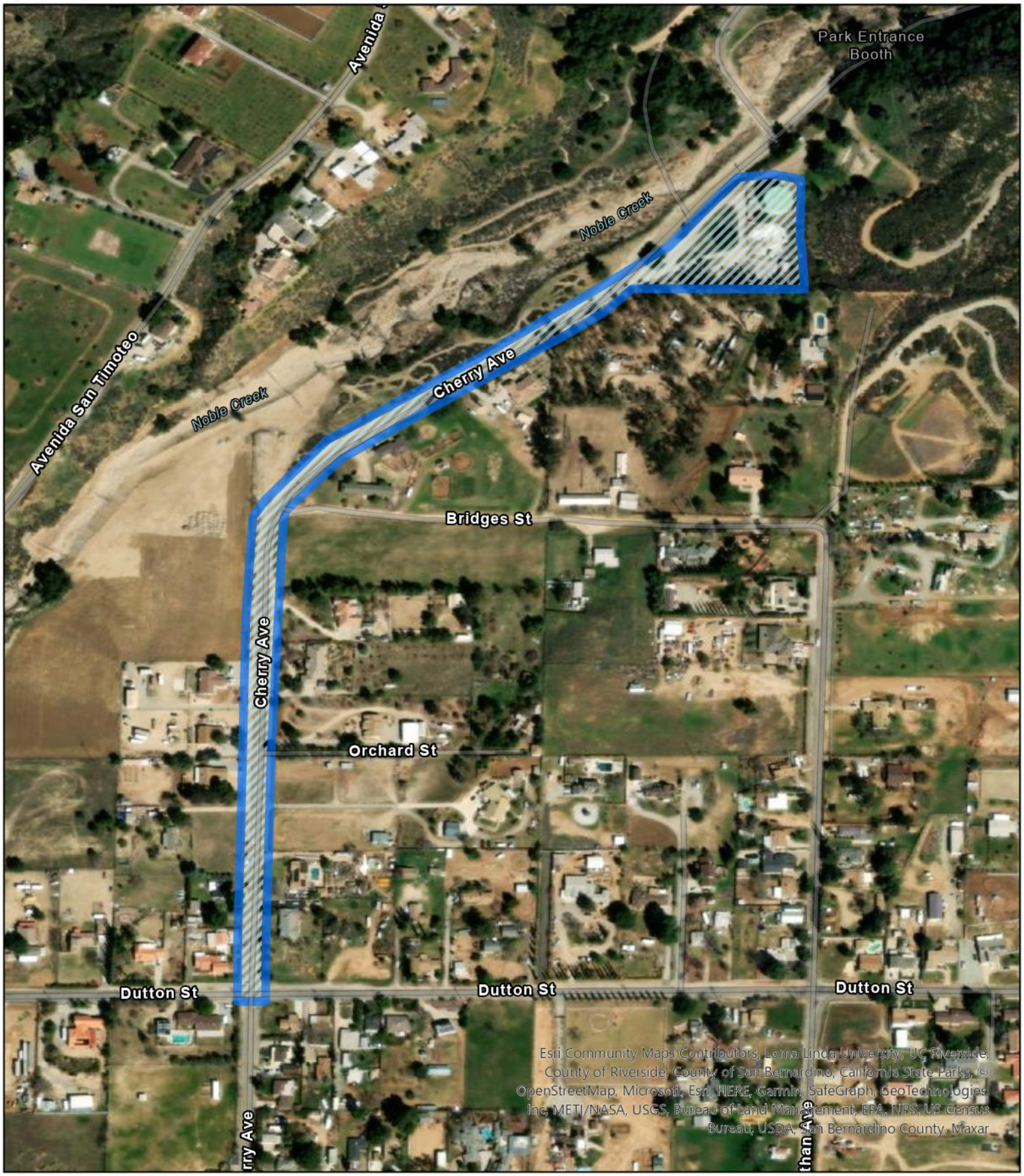
Figure 2. Alternative 1 - No Action
Noble Tank No. 2 and Transmission Line Project



N

0 0.03 0.07 0.14 0.2 Miles

Figure 3. Alternative 2 - Proposed Project/Action
Noble Tank No. 2 and Transmission Line Project



1.0 Introduction

1.1 Document Structure

The Beaumont Cherry Valley Water District has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws ad regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into five parts:

- Introduction
- Comparison of Alternatives, including the Proposed Project/Action
- Environmental Consequences
- Agencies and Persons Consulted
- Appendices

Additional documentation, including more detailed analysis of the project-area resources, may be found in the project planning record located at the Beaumont Cherry Valley Water District office.

1.2 Background

The District was formed in 1919 as an Irrigation District under California Water Code §20500 et seq. to provide domestic and irrigation water to the City of Beaumont, the community of Cherry Valley, and surrounding area. The service area of the District covers approximately 28 square miles, and the District's sphere of influence covers approximately 37.5 square miles, virtually all of which is located within the County of Riverside, and includes the community of Cherry Valley, the City of Beaumont, and small portions of the City of Calimesa. The District also operates wells and a reservoir north of Riverside County in San Bernardino County. The District has a potable and a non-potable water system. The potable water system has 24 wells, 11 pressure zones and 14 tanks. Existing Noble Tank No. 1 is one of two tanks that serve the 3040 Potable Water Pressure Zone, (the "3040" is the operating hydraulic grade line in the pressure zone relative to mean sea level).

The District has about 19,000 service connections and delivers about 13,000 acre-ft/year of potable water. All of the water is from groundwater in Edgar Canyon (Little San Gorgonio Creek) and the Beaumont Groundwater Basin. The District obtains imported State Project Water from the San Gorgonio Pass Water Agency, recharges that water in District-owned spreading basins in Cherry Valley, and subsequently extracts the water for potable use. Since 2007, the District has recharged an average of about 5,000 acre-ft/year of imported water. In January 2016 the District Board of Directors adopted a Potable Water Master Plan Update and subsequently a capital improvement program was adopted which included a number of facilities, including the project for which this Environmental Assessment is being completed for.

1.3 Purpose and Need for Action

The purposed of this initiative is to improve the District's water purveyance system and meet the future demands of the District's projected growing population. This action is needed because existing Noble zone (3040), supplied by the District's base pressure zone (2750), has a need for increased storage capacity to satisfy system demands created by near term development activity. The existing zone is fed by the existing

Noble tank as well as the existing Highland Springs tank which each have a storage volume of 1 Million Gallons (MG). The existing Noble tank is located on Cherry Avenue (APN No. 401-210-010) just south of the Avenida Altura Bella and Cherry Avenue intersection in the Community of Cherry Valley.

1.4 Proposed Action

The District Proposed Project/Action is to construct a water storage tank and a transmission pipeline. The pipeline would be located on District lands. The Proposed Project/Acton would provide additional water storage - to accommodate project needs and planned growth.

The Project site is located approximately 250 feet south of the intersection of International Park Road and Avenue Altura Bella in the Community of Cherry Valley in unincorporated Riverside County. The Project alignment includes portions of the street right of way along International Park Road and Cherry Avenue north of Dutton Street.

The area surrounding the Project site includes Noble Water Storage Tank No. 1 and Bogart Park to the north, rural residential properties to the south, vacant open space the east, and Cherry Avenue followed by Noble Creek to the west with residential properties located on a mesa above. Cherry Avenue and Noble Creek form the low land of the setting at approximately 3,022 feet above mean sea level (amsl). Noble Water Storage Tank No. 1 sits at approximately 3,047 amsl and the homes to the west are located on a mesa at approximately 3,059 amsl. The Project site contains a remnant concrete ring foundation from a former water storage tank that is approximately 100 feet in diameter with an approximately 5-foot high, concrete perimeter wall. The foundation is currently used for miscellaneous equipment storage.

1.5 Decision to be Made

The District has been granted ARPA Funding and the decision has been made to fund the Transmission Pipeline with ARPA Funds and the Noble Water Storage Tank No 2. with District funds.

1.6 Public Involvement

The Project will be listed in the Schedule of Proposed Actions on June 9, 2023. The Project will be provided to the public and other agencies for comment during scoping June 9, 2023 through July 10, 2023.

2.0 Alternatives, including Proposed Action

This chapter describes and compares the alternatives considered for the Noble Water Storage Tank No. 2 and Transmission pipeline project. It includes a description and map of each alternative considered. This section also presents alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

2.1 Alternatives

ALTERNATIVE 1

No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. No building of water storage tank and transmission pipeline would be implemented to accomplish project goals (Figure 1).

ALTERNATIVE 2

Proposed Project/Action

The District's proposed Project/Action is Noble Water Storage Tank No. 2 and Transmission Pipeline Project. The District has been granted ARPA funding which will be only directed to the Transmission Pipeline portion of the project. The Noble Water Storage Tank No. 2 and Transmission Pipeline Project includes:

1. Abandonment and demolition of the existing Noble tank concrete pad located immediately south of the existing Noble Water Storage Tank No. 1 to make space for construction of Noble Tank No. 2 approximately 50 feet to the south.
2. Construction of a 2 MG steel storage tank (Noble Water Storage Tank No. 2) at a high-water level of 3040-ft.
3. Construction of a 6-foot-high security fence around both tanks.
4. Construction of approximately 2,800-feet of approximately 24-inch Ductile Iron Pipe transmission main (ARPA Funded).
5. Construction of a .28 MG overflow storage basin fed from Noble Water Storage Tank No. 2 by a 18-inch reinforced concrete pipeline (RCP) and from Noble Water Storage Tank No. 1 by a 12-inch RCP from.

The pipeline alignment will begin at the new tank location, traverse approximately 1,400 feet southwest along International Park Road, and continue approximately 1,400 feet south along Cherry Avenue (Figure 3). The two-lane roadways are aligned with trees and overhead utilities. Portions of the roadway have dirt shoulders. The pipeline will tie into another pipeline at the intersection of Cherry Avenue and Dutton Street. The pipe invert depth will be approximately 6 to 7 feet below existing ground surface (bgs) and it will be installed using an open cut-and-cover technique.

Construction of the Project is proposed over approximately 90-working days and would consist of approximately 10 days for demolition/site preparation; 20 days for grading activity; 35 days for building construction; and 25 days for paving. Demolition activity would involve removal of the remnant Noble Tank concrete pad foundation. Construction is anticipated to begin in 2023. The average anticipated daily crew size per day is six to eight construction workers. Construction vehicles and equipment employed at the Project site per construction phase are included in Table 1 below.

Table 1. Anticipated Construction Duration and Equipment

Construction Phase	Duration	Vehicles and Equipment
Demolition/site preparation	Approximately 10 days	1 crane 1 watering truck/rubber tired dozer 1 tractor/loader/backhoe 1 grader/concrete saw/dump truck 3 dumpers/tenders
Grading	Approximately 20 days	1 watering truck/rubber tired dozer 1 grader 1 tractor/loader/backhoe
Building construction	Approximately 35 days	1 crane/truck 1 forklift 1 generator 1 tractor/loader/backhoe
Paving	Approximately 25 days	1 cement and mortar mixer 1 paver 1 paving equipment/striping machine 1 roller 1 tractor/loaders/backhoe
Transmission pipeline	Approximately 90 days	1 watering truck/rubber tired dozer 1 tractor/loader/backhoe 1 grader/concrete saw/dump truck 3 dumpers/tenders/1 welder/1 cement and mortar mixer 1 paver 1 paving equipment/striping machine 1 roller

2.2 Permitting and Authorization Summary

The following permits, licenses, agreements, and certifications (PLACs) are required for project construction:

Table 2. Permits and Approvals

Agency	PLAC	Status
Regional Water Quality Control Board	Amended National Pollutant Discharge Elimination System (NPDES) Permit	

The Proposed Project/Action has been sited to avoid direct impact on wetlands and sensitive habitats, including those that could support special status species. Mitigation would be incorporated into the Project to avoid or minimize the potential indirect effects on habitat or sensitive species.

3.0 Environmental Consequences

The purpose of this EA is to enable the District to determine whether the potential environmental impacts of the Propose Project/Action would be significant to human health and the environment. This chapter includes an analysis of the potential environmental consequences or impacts that could result from the Proposed Project/Action and the No Action Alternative. This section summarizes the physical, biological, social, and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. The level of detail in the description of each resource varies with the likelihood of a potential impact to the resource. The following resources are described/evaluated in this chapter.

- Land Use
- Visual Resources
- Geology and Soils
- Water Resources
- Air quality, and Noise
- Biological Resources
- Cultural and Paleontological Resources
- Socioeconomics and Environmental Justice
- Waste Management
- Human Health and Safety
- Transportation
- Infrastructure

3.1 Land Use

3.1.1 Affected Environment

The area affected lies entirely within unincorporated Riverside County in the community of Cherry Valley. The Beaumont Cherry Valley District service area covers approximately 28 square miles, and the District's sphere of influence covers approximately 37.5 square miles, virtually all of which is located within the County of Riverside, and includes the community of Cherry Valley, the City of Beaumont, and small portions of the City of Calimesa. The District also operates wells and a reservoir north of Riverside County in San Bernardino County.

The area surrounding the Project site includes Noble Water Storage Tank No. 1 and Bogart Park to the north, rural residential properties to the south, vacant open space the east, and Cherry Avenue and Noble Creek to the west with residential properties located on a mesa above. Cherry Avenue and Noble Creek form the low land of the setting at approximately 3,022 feet amsl. Noble Water Storage Tank No. 1 sits at approximately 3,047 amsl and the homes to the west are located on a mesa at approximately 3,059 amsl. The Riverside County General Plan Designation of the target area is Open Space Recreation (OS-R) and Rural Community – Very Low Density. The zoning of the site is Residential Agriculture (R-A-1) and Controlled Development Areas (W-2).

3.1.2 Proposed Project/Action Alternative Impacts

The Proposed Project/Action site would be located within the street right of way and on an existing Noble Tank concrete pad located southerly of the existing Noble Tank No. 1, which is proposed to be removed to make space for Noble Tank No. 2. Noble Tank No. 2 would include construction of a 2 MG Steel Storage tank at a high water level of 3040-ft. The proposed construction of the transmission pipeline includes constructing approximately 2,800-feet of 24-inch Ductile Iron Pipe transmission mane. The proposed Project/Action involves improvements to the BCVWD's water storage and water purveyance system in the Community of Cherry Valley. The Project would be constructed in an existing water tank location and would not conflict with any land use plans.

3.1.3 No Action Alternative Impacts

Under the No Action Alternative, the water storage tank and transmission pipeline would not be built. Land use would remain unchanged when compared to existing conditions; thus, there would be no land use impacts from this alternative.

3.2 Visual Resources

3.2.1 Affected Environment

The Project site is located at approximately 3,040 feet amsl in rural Cherry Valley, a community characterized by residential agricultural uses, animal-keeping uses, and open space. The site slopes gently to the south and south-west at approximately 20 feet above street grade. The area is rural in character and represents the foothills of Cherry Valley with the San Bernardino Mountain range located several miles to the north. Cherry Avenue is a two-lane – one lane in either direction – collector road with no curb and gutter or sidewalk. A telephone pole runs along the east side and then west side of Cherry Avenue. The Project site is located in a rural community with very low-density residential uses, agricultural uses, and open space. Bogart Park, a RV, horse, fishing, and hiking-friendly park, exists to the immediate north of the existing water tank (Noble Water Storage Tank. No. 1).

The California Scenic Highways and Historic Parkways Program of 1963 was established "to preserve and protect highway corridors located in areas of outstanding natural beauty" from alteration that would diminish the aesthetics value of the adjacent lands. The target site is not located within an officially designated state scenic highway of the California Scenic Highway Mapping System.[1] Oak Glen Road, located approximately 4,079 feet west of the Project site, is the nearest eligible scenic highway.[2]

3.2.2 Proposed Project/Action Alternative Impacts

The Proposed Project/Action includes the construction of a water storage tank and an underground transmission pipeline. The proposed transmission pipeline would follow the existing roads (Figure 3). Construction activity would be visible to vehicles traveling the roads as construction vehicles and equipment install. Construction would result in short-term visual impacts due to the presence of construction equipment and the new Noble Water Storage Tank No. 2. The proposed water tank (Noble Water Storage Tank No. 2) would be located approximately 70 feet south of an existing green, one-million gallon, 70-foot diameter by 36-foot high water tank (Noble Water Storage Tank No. 1); west of open space covered with Coastal sage scrub; east of Cherry Avenue and Noble Creek, respectively; and north of residential agricultural uses. Noble Water Storage Tank No. 2 would be approximately 100-feet in diameter and 36-feet high. The tanks will be enclosed by a 6-foot-high security fence. The proposed Project would blend with surrounding trees and shrubbery.

The proposed Project/Action is not located within a state scenic highway, and there are no trees, rock outcroppings, or historic buildings within a state scenic highway on or near the Project Site. Various construction equipment identified in Table 1, above, would be used during different phases of the short construction time frame. In its built condition, the Project would be developed with an architectural character similar to the existing water tank immediately north of the Project site. The mass and scale of the

[1] California Department of Transportation (2018). The California Scenic Highway Program.
[2] County of Riverside General Plan (2016, December 6). The Pass Area Plan. Figure 9 Scenic Highways.

new water tank would be similar in appearance to the existing water tank. The new water pipeline would be developed within the street and invisible after construction. The Project would be required to comply with the County of Riverside Ordinances, including Title 15 specifying building and construction standards.[3] The proposed Project/Action does not include any major visual changes to the project site and there would be no impact to visual resources.

3.2.3 No Action Alternative Impacts

Under the No Action Alternative, the water storage tank and transmission pipeline would not be built. No additional impacts to visual resources would occur at the site and conditions would remain unchanged when compared to the existing environment.

3.3 Geology and Soils

3.3.1 Affected Environment

3.3.1.1 Geology

Site Specific Geology

The Proposed Project/Action site is located in the seismically active Southern California region characterized by major faults and fault zones. According to Converse Consultants' Fault Review at Noble Water Storage Tank No. 2, dated February 22, 2018 (see Appendix E for the report), the geologic map (Dibblee and Minch, 2003) shows a fault mapped crossing the tank site. The fault trace is dotted, indicating the fault is concealed by overlying alluvium. The alluvium is old (Pleistocene-aged), indicating a minimum age of approximately 11,000 years. The fault appears to be a trace of the Banning Fault, which is mapped as inactive. Additionally, the California Geological Survey Earthquake Fault Zone Map for the Beaumont Quadrangle (CGS, 1995) does not indicate any active faults or fault zones projecting toward or extending across the Proposed Project/Action site.

Mineral Resources

The Proposed Project/Action site is located on a site used for water storage. The site is located in MRZ-1, an area with no significant mineral deposits according to Figure 4.14.1, the Mineral Resources Zone Map. MRZ-1 are areas where available geologic information indicates no significant mineral deposits are present or that there is little likelihood for their presence.[4]

3.3.1.2 Soils

Expansive soils shrink when dry and swell when wet as a result of a high percentage of clay. Expansion can exert enough pressure to crack sidewalks, driveways, basement floors, pipelines, and even foundations. Subgrade soils on the Project site are composed of sand and gravel.

3.3.2 Proposed Project/Action Alternative Impacts

3.3.2.1 Geology

[3] Codified County of Riverside Ordinance. Title 15 Building and Construction.
[4] County of Riverside General Plan (2016, December 6). The Pass Area Plan. Figure 4.14.1, the Mineral Resources Zone Map

The fault that runs through the proposed Project/Action site is not designated as active by the State of California or Riverside County, there are no requirements for additional investigations or structural setbacks, though Converse recommends siting the proposed tank away from the mapped trace of inactive fault.[5] The site is considered suitable from a faulting standpoint for the construction of the proposed tank. Additionally, according to the Riverside County Parcel Report for the Project site, the Project isn't located within a currently designated Alquist-Priolo (AP) Earthquake Fault Zone.[6]

The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low. The Project would be subject to compliance with Title 15, Chapter 15.60 Earthquake Fault Area Construction of the Codified County of Riverside Ordinance as it may relate to the Project. According to the Pass Area Plan Slope Stability map in the County of Riverside General Plan, the Project area is located in an area with a low to locally moderate susceptibility to seismically induced landslides and rockfalls. Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. The slopes to the east of the proposed Noble Water Storage Tank No. 2 site did not show signs of oversteepening or other indications of previous landsliding.[5]According to the Riverside County Parcel Report for the Project site, the Project has a low potential for liquefaction.

No mineral resource reserves exist on the Project site or vicinity. The Project wouldn't 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.

3.3.2.2 Soils

Review of regional geologic mapping indicates that the tank site and associated alignment is underlain by older alluvial deposits, which primarily consist of sand and minor gravel. The tank site is located adjacent to hills comprised of quartz diorite bedrock. Bedrock is likely present below the tank site at a shallow depth. According to the Pass Area Plan Seismic Hazards map, the Project site isn't located within close proximity to an active fault zone. Additionally, the Project site was previously developed with a tank or would be located under the existing street with engineered and compacted fill dirt material. Existing fill should be considered suitable for re-use as compacted fills provided recommendations of the Project-specific Geotechnical Investigation Report is adhered to during construction of the Project. Compliance with the Project-specific geotechnical investigation report and applicable County building and construction codes would lessen impacts associated with any potential for unstable geologic unit or soil and associated potential for on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse to less than significant.

Construction of the Project could result in soil erosion or loss of topsoil during grubbing and grading activity and development activity. In areas that would require topsoil exposure for construction of new pavement, exposed soils would be compacted and paved over quickly and/or properly covered until developed. In general, the Project would be required to comply with the Codified County of Riverside Ordinances, including Chapter 16.52, Soil Erosion, and Chapter 13.12, Stormwater Drainage System Protection Regulations. Additionally, the Project would be required to comply with Section 402 of the federal Clean Water Act which requires preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) for projects impacting 1 or more acres of landmass. Furthermore, all

[5] Converse Consultants (July 27, 2018). Geotechnical Investigation Report for the Noble Water Storage Tank No. 2 and Transmission Pipeline

[6] County of Riverside (2019, September14). Riverside County Parcel Report for APN 401-210-010.

construction activities would be required to comply with SCAQMD Rule 403 regarding the control of fugitive dust.

In addition, implementation of Mitigation Measure GEO-1 would reduce impacts involving soil erosion or loss of topsoil to less than significant levels. As a result, no long-term adverse impacts to geology and soil resources, as identified, would occur from implementation of the Proposed Project/Action.

3.3.3 No Action Alternative Impacts

The No Action Alternative would result in no additional impacts to geological resources.

3.4 Water Resources

3.4.1 Affected Environment

The District has a potable and a non-potable water system. The potable water system has 24 wells, 11 pressure zones and 14 tanks. Existing Noble Tank No. 1 is one of two tanks that serve the 3040 Potable Water Pressure Zone, (the "3040" is the operating hydraulic grade line in the pressure zone relative to mean sea level). The District has about 17,000 service connections and delivers about 11,000 acre-ft/year of potable water. All of the water is from groundwater in Edgar Canyon (Little San Gorgonio Creek) and the Beaumont Groundwater Basin. The District obtains imported State Project Water from the San Gorgonio Pass Water Agency, recharges that water in District-owned spreading basins in Cherry Valley, and subsequently extracts the water for potable use. Since 2007, the District has recharged an average of about 5,000 acre-ft/year of imported water.

Noble Creek flows to San Timoteo Creek which flows to the Santa Ana River and out to the Pacific Ocean. The Project site is within the boundary of the Santa Ana Region Basin Plan for surface and groundwater. Storm flows from the Project site will be contained onsite via soil percolation or sheet flow into the municipal separate storm sewer system (MS4).

The proposed site is located in Zone X, an area of minimal zone hazard, according to FEMA Flood Panel #06065C0805G.[7] The site is located inland and away from any open water source or flood control dam that could result in a seiche, tsunami, or mudflow.[8]

3.4.2 Proposed Project/Action Alternative Impacts

Siting of the new 2 MG water tank is proposed approximately 50 feet to the south of the remnant tank. The Project also proposes construction of a .28 MG storage basin fed from Noble Water Storage Tank No. 2 by a 18-inch RCP and from Noble Water Storage Tank No. 1 by a 12- inch RCP. The storage basin would provide detention of overflow water from either water tank during the life of the Project in the event of leakage, breakage or tank maintenance. The proposed Project would result in only incremental increase in impervious surfaces and resulting storm flows due to the development. However, the Project wouldn't substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or offsite.

[7] FEMA (2019). FEMA Flood Map Service Center: Search By Address
[8] County of Riverside General Plan EIR (2015, February). Section 4.11 Flood and Dam Inundation Hazards

3.4.2.1 Impacts to Surface Water and Stormwater

The Project would include a storage basin and storm drain system designed to capture a 500- and 100-year flood event. On-site stormwater patterns would remain the same. No stream or river exists on the Project site. Noble Creek, which eventually flow into San Timoteo Creek, flows through the middle of this Community of Cherry Valley and is located to the west and adjacent to the Project. However, the proposed Project would not impact Noble Creek either directly or indirectly as proper mitigation will be put in place as identified in Mitigation Measure BIO-2 in Section 3.13.

While the Project would result in a slight increase in impervious surface for development of the new tank and extension of water pipeline, the Project would not increase impervious surfaces and/or nuisance and storm flows such that flows could not be accommodated by the existing storm drain system. The Project would not result in runoff that would exceed the capacity of existing or planned storm water drainage systems or result in downstream water pollution (e.g., pathogens, sedimentation, metals, hydrocarbons, nitrates).

The storage basin would provide detention of overflow water from either water tank during the life of the Project in the event of leakage, breakage or tank maintenance. The Project wouldn't substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or offsite. As a result, the Project would not result in downstream water pollution (e.g., bacterial indicators, metals nutrients pesticides, toxic organic compounds, sediments trash & debris, oil & grease), sedimentation, and/or flooding. Potential short-term surface water quality impacts related to Project construction activities include runoff of loose soils and/or construction wastes and fuels that could potentially percolate into the ground or enter Noble Creek.

Proper procedures and practices would ensure minimal impacts from stormwater runoff during construction and site operation of the District. Therefore, impacts to surface water and stormwater are expected to be negligible during implementation of the proposed Project/Action.

3.4.2.2 Impacts to Groundwater

The Project would develop a new water tank and pipeline and would not involve the extraction of groundwater. Groundwater was not encountered in the exploratory borings to the maximum explored depth of 51.0 feet below ground surface (bgs). Based on available data, groundwater is deeper than 50 feet bgs. Groundwater is not expected to be encountered during the construction of this Project.[9] The Project is not anticipated to alter or deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

Proper procedures and practices would ensure minimal impacts during construction and site operation of the District. Therefore, impacts to groundwater are expected to be negligible during implementation of the proposed Project/Action.

3.4.2.3 Impacts to Water Use

[9] Converse Consultants (July 27, 2018). Geotechnical Investigation Report for the Noble Water Storage Tank No. 2 and Transmission Pipeline.

The Proposed Project/Action would have a positive impact as it would allow the District to meet the demands or a growing population and would align with the Beaumont Cherry Valley District goals. As stated in section 3.4.1, the District provides Cherry Valley water from groundwater in Edgar Canyon (Little San Gorgonio Creek) and the Beaumont Groundwater Basin. The District obtains imported State Project Water from the San Gorgonio Pass Water Agency, recharges that water in District-owned spreading basins in Cherry Valley, and subsequently extracts the water for potable use. Proper procedures and practices would ensure minimal impacts from stormwater runoff during construction and site operation of the District. Therefore, impacts to water use are expected to be negligible during implementation of the proposed Project/Action.

3.4.3 No Action Alternative Impacts

The No Action Alternative would have no impacts to surface water or groundwater resources beyond those resulting from the continued operation of currently existing facilities.

3.5 Air Quality and Noise

3.5.1 Affected Environment

3.5.1.1 Air Quality

The basis for air quality review in the Project area is evaluating consistency with the South Coast Air Quality Management District (SCAQMD) regulations, which are designed to bring the South Coast Air Basin (SCAB), including the Community of Cherry Valley, into attainment for all National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS).

An ambient air quality standard (AAQS) defines the maximum amount of a pollutant that can be present in outdoor air without harm to the public's health. Ambient air quality standards for ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter (PM10 and PM2.5), and lead (Pb) have been set by both the State of California and the federal government. The State has also set standards for sulfates (SO4(2-)) and visibility. AAQSs are set to regulate air emissions from stationary and mobile sources to achieve clean air and to protect even the most sensitive individuals in our communities.

The SCAQMD in conjunction with the California Air Resources Board (CARB), the Southern California Association of Governments (SCAG), and USEPA prepares and regularly updates an Air Quality Management Plan (AQMP 2016) to set forth an integrated program to achieve compliance with air quality standards in the Basin.[10] Currently, the Community of Cherry Valley is out of compliance with CAAQS PM10 and ozone standards and NAAQS for PM2.5 and ozone standards.[11]

Sensitive receptors include a class of receivers considered "sensitive" to environmental factors. By definition, sensitive receptors include, but are not limited to, residential uses, hospitals, schools, daycare facilities, elderly housing, and convalescent facilities. The Project would be near rural residence to the south of the proposed tank and west of Cherry Avenue. All off-road construction equipment and some support vehicles are expected to be diesel fueled. Diesel exhaust particulate matter qualifies as a Toxic Air Contaminant by the State of California as defined in California Health and Safety Code §39655. Particulate

[10] Southern Coast Air Quality Management District (2016, March). Air Quality Management Plan
[11] California Air Resources Board (2018). Air Designation Maps – State and National

matter from diesel-fueled engines (diesel PM) contributes over 70% of the known risk from air toxics today. Reducing the public's exposure to diesel PM is one of ARB's highest priorities, with an aggressive plan to require cleaner diesel fuel and cleaner diesel engines and vehicles. As a result, trucks and cars today are 95% cleaner than just 30 years ago.

Potential odors associated with the Project would be diesel exhaust during the construction period. However, construction vehicle emissions at the Project site would be short-term, intermittent, and subject to air dispersion. These odors, if perceptible, are common in the environment, would dissipate rapidly as they mix with the surrounding air, and would be of very limited duration. In addition, the Project would be subject to compliance with SCAQMD's Rule Book Regulation IV – Prohibitions, Rule 402, regarding nuisance. SCAQMD Rule 402 states, "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public or which cause, or have a natural tendency to cause, injury or damage to business or property."

Greenhouse gases are gases that cause and contribute to climate change, commonly referred to as global warming. They vary in potency and are usually measured in tons or million metric tons of carbon dioxide equivalents. Transportation followed by electricity generation and natural gas used in buildings are the largest sources of California's GHG emissions.[12] As legislation like Assembly Bill 32 (California Global Warming Solution Act of 2006), California Senate Bill 97 and Executive Order S-3-05 have brought the requirement for GHG reductions to the forefront of Californian conscientious, GHG reductions have become important, through increased vehicle fuel efficiency, building energy efficiency and increased reliance on renewable energy sources.

3.5.1.2 Noise

Construction noise is one of the most common mobile noise sources in the County and the use of pile drivers, drills, trucks, pavers, graders, and a variety of other equipment can result in short, sporadic elevated noise levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Construction noise reduction methods should be utilized to the maximum extent feasible near sensitive receptors, such as homes.

Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site but is expected to be very short term and is not anticipated to result in structural damage.

3.5.2 Proposed Project/Action Alternative Impacts

3.5.2.1 Air Quality

[12] Institute of Local Government (2011, September). Evaluating Greenhouse Gas Emissions as Part of California's Environmental Review Process: A Local Official's Guide.

The Project would result in short-term air quality impacts related to vehicle/equipment exhaust, fugitive dust, asphalt/concrete slurry, and building construction for construction within the approximately 3.97-acre Project construction envelope. Operation phase air quality impacts are expected to be limited to water tank operation and maintenance and vehicular traffic associated with maintenance. Estimated Project criteria pollutant emissions for construction and operation are summarized below in Table 3 and Table 5 (see Appendix B for the CalEEMod calculations), and Project air emissions compared to Localized Significance Thresholds (LST) are summarized in Table 4.

Table 3. Project Construction Emissions Versus SCAQMD Significance Criteria

	Emissions (pounds per day)						
	VOC	**NO_x**	**SO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**Lead (Pb)**
Project Construction Emissions	3.08	30.07	0.04	22.32	3.98	2.52	--
Regional Thresholds	75	100	150	550	150	55	3
Exceeds Thresholds?	No	No	No	No	No	No	N/A
Source: CalEEMod (2019, September 13). Project Air Emission Calculations							

Table 4. Project Operation Emissions Versus SCAQMD Significance Criteria

	Emissions (pounds per day)						
	VOC	**NO_x**	**SO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**Lead (Pb)**
Project Construction Emissions	4.01	1.7000e-004	0.02	0.02	7.0000e-005	7.0000e-005	--
Regional Thresholds	55	55	150	550	150	55	3
Exceeds Thresholds?	No	No	No	No	No	No	No
Source: CalEEMod (2019, September 13). Project Air Emission Calculations							

Table 5. CalEEMod Results Compared to Localized Significance Thresholds (LSTs)

	Emissions (pounds per day)			
	NO_x	**CO**	**PM_{10}**	**$PM_{2.5}$**
Construction				
CalEEMod Emissions	30.07	22.32	3.98	2.52
Construction Thresholds	236	2,817	21	11
Exceed Thresholds?	No	No	No	No
Operation				
CalEEMod Emissions	1.70000e- 004	0.02	7.0000e- 005	7.0000e- 005
Operation Thresholds	236	2,817	6	3
Exceed Thresholds?	No	No	No	No
Source: CalEEMod (2019, September 23). Project Air Emission Calculations; SCAQMD Mass Rate Look-up Tables for 5 acres in Banning Airport (Air Monitoring Area #29) at 25 meters (~82 feet) from Project site (emissions source)				

As shown in Table 3 and Table 4, Project construction and operation emissions are below the applicable SCAQMD regional and localized mass emissions thresholds of significance.8 In addition, the Project would be required to comply with applicable rules in the SCAQMD Rule Book, Regulation IV - Prohibitions,9 such as Rule 403 for fugitive dust suppression. Examples of Rule 403 control measures include, but are not limited to:

- Maintain stability of soil through pre-watering of site prior to clearing and grubbing, during clearing and grubbing activities, and after clearing and grubbing activities.
- Pre-water soils prior to cut and fill activities and stabilize soil during and after cut and fill activities.
- Stabilize material while loading to reduce fugitive dust emissions; maintain at least six inches of freeboard on haul vehicles; stabilize material while transporting to reduce fugitive dust emissions; stabilize material while unloading to reduce fugitive dust emissions; and comply with Vehicle Code §23114.

Considering the Project would not result in population growth and mass emissions are below the thresholds of significance, the Project impacts are considered less than significant.

Project construction would occur with minimal equipment over a 90-working day period and is not anticipated to create any substantial long-term GHGs for the Project area. Operation GHG emissions are expected to be primarily related to water tank operation and maintenance. Project construction and operation GHG emissions have been estimated using the CalEEMod 2016.3.2. Estimated total Project construction and annual operation GHG emissions are presented below in Table 3. Refer to Table 5 of this IS/MND for a review of the CalEEMod Project air emissions calculations.

Considering the short-term nature of construction activities as well as the minimal total GHG emissions estimated for Project construction and operation, the Project is not expected to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

While the Project would enable increased level of water output within BCVWD water service area, it would not cause an increase in population or traffic. The Project would contribute to a slight increase in energy use for the water tank if generation is necessary. It is anticipated that construction of the Project would generate GHG emissions that would impact the regional GHG attainment goals as identified in Table 5 above.

3.5.2.2 Noise

The Project would result in short-term construction noise associated with site preparation, demolition, grading, and construction. Pursuant to Chapter 9.52.010, Noise Regulation, of the Codified County of Riverside Ordinance, when sound becomes noise it may jeopardize the health, safety, or general welfare of Riverside County residents and degrade their quality of life. Section 9.52.020, Exemptions, dismisses sound emanating from a list of sources, including A) facilities owned or operated by or for a government agency; and B) capital improvement projects of a government agency. The Project is designated as Open Space Recreation (OS-R) land use. Section 9.52.040 of the County's noise regulation establishes the following sound level standard as shown in Table 6 below.

Table 6. County of Riverside Exterior Sound Level Standards (dB L_{max})

General Land Use Designation	Maximum Decibel Level	
	7:00 a.m. – 10:00 p.m.	10:00 p.m. – 7:00 a.m.
Open Space – Recreation (OS-R)	45 dBA	45 dBA

Operational noise from the water tank system could result in an incremental increase in noise levels at points of mechanical operation. However, since the Project is not itself growth-inducing, any incremental increase in noise is not anticipated to result in exceedance of noise level standards and therefore would not

be readily audible over ambient noise levels at any of the nearby sensitive receptors, namely the rural residences south of the Project site. No increase in ground borne vibration or noise is anticipated during Project operation. Project operational noise would comply with the goals and policies of the County's General Plan and is not expected to expose sensitive receptors to excessive noise levels and impacts are anticipated to be less than significant.

3.5.3 No Action Alternative Impacts

Under the No Action Alternative, there would be no expected change to ambient noise levels and no impact to meteorology and air quality.

3.6 Biological Resources

3.6.1 Affected Environment

The area is vegetated with disturbed, ruderal vegetation and approximately seven Coastal live oak. Riparian habitat is associated with areas that become saturated with water from surface or groundwater resources and retain enough water to enable riparian flora and fauna to thrive. Though no jurisdictional areas were within the proposed Project area, Noble Creek, a USGS-designated intermittent stream (i.e., blue-line), was present within 500-feet of the Project both north and west of Cherry Avenue.[13] The creek is vegetated with Coastal sage scrub, clumps of Coast live oak, Western sycamore riparian woodland and mulefat scrub.[13]

The Project is located in the Pass Area Plan within Subunit 2: Badlands/San Bernardino National Forest of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The majority of the Project is located within the southern portion of Criteria Cell Group D which targets long-term conservation in the northern portion of the Criteria Cell Group.

3.6.2 Proposed Project/Action Alternative Impacts

3.6.2.1 Common Species

General Vegetation

The site was primarily located in Developed/Disturbed/Ruderal areas with only remnant coastal sage scrub within the Noble Tank No. 2 area. The biological value of the proposed Project was absent in the street right-of-way of Cherry Avenue and International Park Road where the water pipeline is proposed and low in the area around Noble Water Storage Tank No. 2 where non-native grasses and disturbed sage scrub exist.[13] Ruderal/Coastal sage scrub surrounds Noble Water Storage Tank No. 1 to the north and is along the northern and eastern perimeter of the proposed tank site. A mature Coast live oak exists in the proposed .28 MG overflow storage basin.[13] Its removal might be required for development of the basin.

Migratory Birds

The federal Migratory Bird Treaty Act (MBTA), first enacted in 1918, prohibits any person, unless permitted by regulations, to

[13] Searl Biological Services (2018, September 10). Biological Inventory for the Beaumont-Cherry Valley Water District's Noble Water Storage Tank No. 2 and Transmission Pipeline.

... pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatsoever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention … for the protection of migratory birds ... or any part, nest, or egg of any such bird. (16 USC 703)

The list of migratory birds includes nearly all bird species native to the United States, and the statute was extended in 1974 to include parts of birds, as well as eggs and nests. The Migratory Bird Treaty Reform Act of 2004 further defined species protected under the act and excluded all non-native species. Activities that result in removal or destruction of an active nest (a nest with eggs or young) would violate the MBTA.[13] Removal of unoccupied nests and bird mortality resulting indirectly from disturbance activities are not considered violations of the MBTA. While the Project vicinity provides linkage to wildlife corridors and native habitat, the Project site is composed of primarily disturbed, ruderal vegetation that offers little habitat value to resident or migratory wildlife and no habitat for migratory fish.[13] However, while the Project site does not have native habitat due to urbanization, Coastal live oak and Coastal sage scrub within the Project alignment could offer nesting habitat to birds protected under the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code §3503, §3503.5, and §3513, such as ducks, geese, songbirds, gulls, shorebirds, wading birds, and/or birds of prey. If Project activities occur during the bird nesting season (typically February 15 through September 1), a nesting bird survey shall be performed prior to construction to attenuate the potential for significant impact to migratory birds.[13] Implementation of Mitigation Measure BIO-3 would reduce potential impacts to migratory birds to less than significant.

3.6.2.2 Federally Listed, Candidate, and Other Protected Species

The biological reconnaissance survey regulatory-status species queries yielded a total of 12 regulatory-status species documented to occur within three miles of the Project. The list can be found in Table 1 of Appendix C of this document. Additionally, portion of the Project is also located within a MSHCP-designated assessment area for two Narrow Endemic Plants; many-stemmed dudleya (Dudleya multicaulis) and Yucaipa onion (Allium marvinii). The Project area does not support suitable habitat (i.e., clay soils and rock outcrops) for those two species.[13] No regulatory-status flora or fauna were detected during the biological reconnaissance surveys.[13]

Riverside County Ordinance 559 prohibits the removal of any living native tree on any parcel or property greater than one-half acre in size, located in an area above five thousand (5,000) feet in elevation within the unincorporated area of the County without first obtaining a tree removal permit. The Project site is located at approximately 3,040 feet amsl. However, according to Ordinance 559, public utilities are exempt from the requirement to obtain a tree removal permit for projects related to the construction and maintenance of facilities under their jurisdiction (Riverside County, 2018).

According to the biological survey performed by Searl Biological Services on June 8, 2018 and August 3, 2018, the Project wouldn't have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and game or U.S. Fish and Wildlife Service.[13] The Proposed Project/Action would be subject to Mitigation Measure BIO-1 Prevent Entrapment of Wildlife, BIO-2 Construction Staging Away from Noble Creek, and BIO-3 Conduct Nesting Bird Surveys, described in Section 3.13 Mitigation Measures. The proposed Project/Action would result in

no significant impacts to biological resources. The Project proposes Mitigation Measure BIO-2 to reduce potential impacts to any riparian habitat (i.e. Noble Creek) or other sensitive natural communities identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service would result from the Project. With implementation of Mitigation Measure BIO-2, Construction Staging Away from Nobel Creek, no impact to federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means would result from the Project.[13]

3.6.3 No Action Alternative Impacts

The No Action Alternative would result in no change to wildlife and fisheries. There would be no impacts to biological resources.

3.7 Cultural and Paleontological Resources

3.7.1 Affected Environment

3.7.1.1 Cultural

NEPA requires consideration of the effects to all aspects of the human environment. The National Preservation Institute explains that culturally valued aspects of the environment generally include historic properties, other culturally valued pieces of real property, cultural use of the biophysical environment, and such "intangible" sociocultural attributes as social cohesion, social institutions, lifeways, religious practices, and other cultural institutions.[14] Historical resources could be objects, a building, a structure, a site, an area, a place, a record, or a manuscript which a lead agency determines to be historically significant based on the above-stated criteria, provided the lead agency's determination is supported by substantial evidence in light of the whole record. The National Register of Historic Places is a listing maintained by the federal government of prehistoric, historic, and ethnographic buildings, structures, sites, districts, and objects that are considered significant at a national, state or local level. Cultural resources that meet the criteria for listing on the National Register of Historic Places are called historic properties.

The proposed project area is within the Community of Cherry Valley and on the edge of the Noble Creek floodplain. The area is between approximately 2,920 feet and 3,020 feet above mean sea level and slopes down towards the southwest.

3.7.1.2 Paleontological

Paleontological resources are the fossilized biotic remains of ancient environments, including fossilized flora and fauna. Riverside County has been assessed for geologic formations known to potentially contain paleontological resources. Lands with low, undetermined or high potential for finding paleontological resources are mapped on the County's Paleontological Sensitivity Resources map. This map is used in the environmental assessment of development proposals and the determination of required impact mitigation. Riverside County has an extensive record of fossil life starting in Jurassic time, 150 million years ago. The County of Riverside General Plan Paleontological Sensitivity Map shows the Project site in an area of

[14] National Preservation Institute (2022) National Preservation Institute What are "Cultural Resources"?

"undetermined potential (u)" for paleontological resources.[15] Paleontological fossils are typically encountered during grading in geologic formations that contain important non-human fossil.

3.7.2 Proposed Project/Action Alternative Impacts

3.7.2.1 Cultural

The project follows the west side of Cherry Avenue/International Park Road, bounded to the south by Dutton Street and to the north by Avenue Altura Buena. A Phase I Cultural Resources Inventory was completed September 2018. Geovironment Consulting conducted a record search/literature review of the Project area on August 16, 2018 at the Easter Information Center, located at the University of California, Riverside. (See Appendix D for the report.)[16] The purpose of this review was to access any existing cultural resources survey reports, archaeological site records, and historic maps to evaluate whether previously documented prehistoric or historic archaeological sites, architectural resources, cultural landscapes, or ethnic resources exist within or near the Project area.

The record search/literature review was also conducted to evaluate whether any historic properties listed on or determined eligible for listing on the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) exist within the Project area. No historic properties were detected during the records search.[16] Geovironment Consulting used the results of the record search to develop a rudimentary research design to guide the survey. In addition, experience with conducting similar surveys in the area suggested that it was highly unlikely that previously unrecorded historic refuse would be located on the property which could be of sufficient age to merit documentation. Geovironment archaeologist, Jay Sander, conducted a desktop study of the Project area on August 23, 2018. The entire Project area has disturbed been through grading and disking; thus, any construction activities would not constitute a significant impact to any historical resources.[16]

Results of the review of the survey reports and site records provided by the Eastern Archaeological Information Center indicate that a total of 26 previous cultural resource inventories or other archaeological investigations have been conducted within a one-mile radius of the Project area including three that included portions of the current Project area (see Table 1 of the Phase I Cultural Resources Inventory).[16] Seven additional reports provide overviews of the Project vicinity.[16] The records search also revealed that there are eight previously recorded cultural resources within a one-mile radius of the Project area.[16] None of these are within or adjacent to the Project area. While Project improvements are not anticipated to impact native base rock or native soils that could contain unique archaeological sites deemed significant, Mitigation Measure CULT-1 would reduce the potential for impacts.

3.7.2.2 Paleontological

The Project would result in shallow subsurface impacts within a developed area that contains engineered fill material within street right of way and from prior tank siting at the location of the proposed water tank. While Project improvements are not anticipated to impact native base rock or native soils that could

[15] County of Riverside General Plan EIR (2014, March). Section 4.9 Cultural and Paleontological Resource. Figure 4.9.3 Paleontological Sensitivity Map

[16] Geovironment Consulting (2018, September 13). A Phase I Cultural Resources Inventory for the Noble Water Storage Tank No. 2 and Transmission Pipeline Project, Cherry Valley, Riverside County, California.

contain unique paleontological sites, implementation of Mitigation Measure GEO-2 would reduce the potential for significant impact to paleontological resources to less than significant.

3.7.3 No Action Alternative Impacts

Under the No Action Alternative, the water storage tank and transmission pipeline would not be built. There would be no impacts to cultural resources under this alternative.

3.8 Socioeconomics and Environmental Justice

3.8.1 Affected Environment

3.8.1.1 Socioeconomics

Socioeconomics considers the attributes of human social and economic interactions associated with the Proposed Project/Action. The population of the Cherry Valley community was approximately 6,362 at the 2010 census and 5,891 at the 2000 census. Population grew in the community at a rate of approximately 7 percent which is significantly slower than the greater Riverside County, which has doubled in a twenty-year span and estimated to be 2,450,758 as of 2018. BCVWD has been servicing the area since approximately 1919 with water infrastructure.

3.8.1.2 Environmental Justice

Under Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," federal agencies are responsible for identifying and addressing the possibility of disproportionately high and adverse human health or environmental effects from its program, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions.

Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks," states that each federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

3.8.2 Proposed Project/Action Alternative Impacts

3.8.2.1 Socioeconomic Impacts

The Project would not involve an increase in population using public services with exception of approximately 6-8 construction workers. The Project involves water storage and purveyance to meet future demand in BCVWD's service area as identified in the Water Facilities Master Plan.[17] The operation would be maintained by existing BCVWD's staff. The Project would not result in significant threats of deterioration to the existing levels of service at public service facilities nor the need to build additional public service facilities.

The Project proposes development of Noble Water Storage Tank No. 2 and approximately 2,800 linear feet of water transmission pipeline at an existing BCVWD-owned water utility location. The Project would

[17] Beaumont-Cherry Valley Water District (2016, January 13). Final Potable Water System Plan.

increase storage capacity to respond to demand within BCVWD's service area. While the proposed Project wouldn't induce growth in the community, it would enable the BCVWD meet future water demand in the area.

3.8.2.2 Environmental Justice Impact

The proposed Project/Action Alternative would not result in adverse or significant impacts in any environmental resource category. The proposed Project/Action would not result in significant noise or visual affects in any location. The proposed Project/Action would not result in a disproportionately high and adverse effect on a low-income or a minority population.

3.8.3 No Action Alternative Impacts

Under the No Action Alternative, the water storage tank and transmission pipeline would not be built. The District would continue to provide water to the District occupants to meet water needs. There would be no additional socioeconomic or environmental justice impact.

3.9 Waste Management

3.9.1 Affected Environment

The proposed area to be affected is located within unincorporated Riverside County in the Community of Cherry Valley. The proposed Project is not located on a site included on a list of hazardous materials sites compiled pursuant to California Government Code §65962.5. (www.envirostor.dtsc.ca.gov/public/ or http://geotracker.waterboards.ca.gov accessed on October 9, 2018).

3.9.2 Proposed Project/Action Alternative Impact

Construction activities associated with the proposed Project would use small quantities of hazardous and flammable substances routinely utilized in the operation of equipment and vehicles, including but not limited to, oil, diesel fuel, and transmission fluid. Transport, use, or disposal of these hazardous substances during construction would occur according to instructions provided by the product manufacturer, including proper methods of storage and disposal. The potential for the release of these materials is considered low and, even if a release were to occur it would not result in a significant hazard to the public, surrounding uses, or the environment due to the small quantities of these materials associated with construction and operation. Use and storage of such hazardous materials would be required to comply with product labeling and disposal requirements. Trenching would be required to install the proposed water pipeline. Construction is not anticipated to unearth any hazardous materials as the transmission pipeline will align with the street right of way that has been previously disturbed. Any hazardous materials generated during construction would be disposed of as required by the construction plans and permits.

The Project would implement spill prevention and clean-up best management practices identified in Mitigation Measure HAZ-1 described in Section 3.13 to reduce the potential for the release of hazard to the public or the environment through during construction of the Project. The Proposed Project/Action is not expected to have any adverse effects with respect to hazardous materials.

3.9.3 No Action Alternative Impacts

Under the No Action Alternative, the water storage tank and transmission pipeline would not be built. There would be no impacts and material and waste management would remain unchanged compared to existing conditions.

3.10 Human Health and Safety

3.10.1 Affected Environment

The proposed area to be affected is located in the community of Cherry Valley. The area surrounding the Proposed Project/Action site is designated rural living and open space. Cherry Valley Brethren Preschool is the nearest school to the Project site located approximately 1.40 miles southwest of the anticipated construction route. The nearest public airport to the proposed Project site is Banning Municipal Airport in Banning, CA (BNG / KBNG) which is 14 miles away.[18]

3.10.2 Proposed Project/Action Alternative Impact

The Project would involve the use of concrete, asphalt, slurry seal, paint, and solvents during construction use and storage of which would be required to comply with product labeling. The proposed Project does not involve transporting or emitting acutely hazardous materials that could result in a danger to a nearby school. The potential risk of construction-related injuries to worked would be minimized through safety training, use of appropriate safety equipment, and development and adherence to health and safety plans. Under the Proposed Project/Action Alternative, there would likely be no accidents that would result in harm to the environment, workers, or the public from a waterline failure.

3.10.3 No Action Alternative Impacts

Under the No Action Alternative, there would likely be no accidents that would result in harm to the environment, workers, or the public from a waterline failure. Additionally, the site has emergency procedures to respond to any type of accident, including emergency response plans and procedures for the current water purveyance system.

3.11 Transportation

3.11.1 Affected Environment

The Project site is accessed by I-10 freeway and a local roadway network consisting of arterial, secondary, and collector streets. Beaumont Avenue, a secondary arterial, that connects with the I-10 freeway; Brookside Avenue, a collector street; and Cherry Avenue, a collector street, all provide access to the Proposed Project site. In general, secondary arterials carry traffic along the perimeters of major developments, provide support to the major arterials, and are also through streets enabling traffic to travel uninterrupted for longer distances through the City. Collector roadways are typically two-lane streets that connect the local streets with the secondary arterials allowing local traffic to access the regional transportation facilities.

[18] Travelmath (2019). Nearest Airport

3.11.2 Proposed Project/Action Alternative Impacts

The Project would be designed and engineered in compliance with the County of Riverside standards; Caltrans standards; and the requirements of the California Manual of Uniform Traffic Control Devices (CMUTCD), as applicable. For example, CMC Title 12 Street, Sidewalks and Public Places establishes compliance with street grades, construction and maintenance of sidewalks, curbs, and driveways. The Proposed Project/Action doesn't include alternative modes of transportation, bicycles or pedestrian facilities. Construction and operation of the Project would result in an incremental increase in traffic on nearby roads but would not result in an appreciable increase in traffic to the existing average daily traffic (ADT) on street segments or the level of service (LOS) at intersections.

Under California law, every county with an urbanized area of 50,000 or more people must adopt a Congestion Management Program (CMP). The Riverside County CMP monitors levels of service and congestion throughout the County along the major corridors. The nearest CMP monitoring facility in the Project vicinity is State Route 79 (SR 79) and Interstate 10 (I-10) in the City of Beaumont. Exhibit 4-1A Level of Service on CMP System in Western Riverside shows that SR 79 near the I-10 operates at an acceptable LOS C with an ADT of 2,150 and it isn't deficient per Caltrans Performance Measurement System (PeMS) Speed Data.[19] The Project's contribution of vehicles to the local CMP-monitored corridors would be minimal and would not result in a significant cumulative contribution to the flow of traffic on any major thoroughfares included in the congestion management program (CMP) system for Riverside County.

The deployment of construction trucks and equipment on the freeway and/or local arterials and collectors during construction would result in a slight increase in traffic during the approximately 90-day construction period. Total daily construction vehicles trips are estimated at 16 trips/day during demolition, 15 trips/day during site preparation, 12 trips/day during grading, 80 trips/day during building construction, and 18 trips/day. It is assumed that off-road equipment would be delivered by vendors and staged near the Project site. Table 7 below provides a breakdown of anticipated number of worker and vendor trips and length of trip in miles per day during construction of the Project.

Table 7. Daily Construction Trip Generation

Phase Name	Off-Road Equipment #	Worker Trip #	Vendor Trip #	Haul Trip #	Worker Trip Length (mi)	Vendor Trip Length (mi)	Haul Trip Length (mi)
Demolition	8	8	0	0	14.70	6.90	20
Site Preparation	7	8	0	0	14.70	6.90	20
Grading	4	8	0	0	14.70	6.90	20
Building Construction	5	75	29	0	14.70	6.90	20
Paving	5	13	0	0	14.70	6.90	20
Notes: worker trip #'s + vendor trip #'s = daily vehicle trips Source: CalEEMod (2018, October 22). Project Air Emission Calculations							

The greatest daily traffic volume would occur during the building construction phase of construction with the addition of up to 80 vehicle trips/day from the Project site on the nearby roadways (i.e., collector, arterial, expressway or freeway). The incremental increase in traffic volume during construction would

[19] Riverside County Transportation Commission (2011, December 14). 2011 Riverside County Congestion Management Program.

have a nominal impact compared to acceptable average daily traffic (ADT) on road segments and level of service (LOS) at intersections for nearby roadways. In general, daily construction vehicle trips would be short-term and have a relatively small impact on daily traffic generation in the area. In addition, through traffic on roadways in the construction areas would be maintained at all times during construction. The Project would be serviced by a small crew of BCVWD employees during operation, as needed, and would not add appreciable vehicular traffic to the street system. At least one lane would remain open at all times for through traffic during construction on Cherry Avenue and International Park Road as described in Mitigation Measure TRAF-1 in section 3.13. Implementation of Mitigation Measure TRAF-1 would reduce construction impacts to traffic circulation to not significant.

3.11.3 No Action Alternative Impacts

Under the No Action Alternative, the water storage tank and transmission pipeline would not be built. There would be no affect to transportation.

3.12 Infrastructure

3.12.1 Affected Environment

Site infrastructure includes those basic resources required to support the construction and operation of the District's water storage tank and transmission pipeline.

3.12.2 Proposed Project/Action Alternative Impacts

The Proposed Project/Action Alternative involves construction of a water storage tank and transmission pipeline. Noble Tank No. 2 would be built in an existing water storage tank location and would not involve impacts to infrastructure. The transmission pipeline would be located within the street right of way and would also not involve impacts to infrastructure. Positive impacts such as increased water storage and improvements to the water purveyance system would result from the Proposed Project/Action of the Beaumont Cherry Valley Water District.

3.12.3 No Action Alternative Impacts

Under the No Action Alternative, the water storage tank and transmission pipeline would not be built. Infrastructure would remain unchanged when compared to existing conditions. There would be no affect to infrastructure.

3.13 Mitigation Measures

BIO-1. Prevent Entrapment of Wildlife. During construction, to prevent entrapment of wildlife, all steep-walled trenches, auger holes, open-ended piping, or other excavations should be covered at the end of each day or completely fenced off at night in such a way that wildlife cannot become entrapped. For open trenches only, these may instead have wildlife escape ramps within the trench maintained at intervals of no greater than 100 feet. These ramps shall have a maximum slope not to exceed 2:1.

BIO-2. Construction Staging Away from Noble Creek. In all locations of the Project, construction activities, vehicular traffic (including movement of all equipment), and storage of construction materials shall be restricted to established construction areas indicated by flagging, fencing, and/or signage. No

equipment should be staged on the north or west side of Cherry Avenue to reduce potential impacts to Noble Creek.

BIO-3. Conduct Nesting Bird Surveys. If Project activities occur during the bird nesting season (i.e., February 1 through August 31), a pre-construction nesting bird survey should be performed by a qualified biologist no more than three days prior to any construction activities to avoid any direct or indirect impacts to active nests and thus ensure compliance with the Migratory Bird Treaty Act (MBTA) and California Fish and Wildlife Code.

Additional measures may be put in place based on the results of the nesting bird survey at the discretion of the biologist performing the survey. These may include measures such as construction personnel training, the establishment of no disturbance buffers, on-site construction monitoring and/or spot monitoring.

CULT-1. Archeological Resources. If unanticipated cultural resources are unearthed during construction excavations, the contractor shall cease all earth-disturbing activities within a 100-foot radius of the area of discovery until the discovery can be evaluated by a qualified paleontologist to assess the significance of such resources and shall meet with the City Director of Development Services to assess the significance of such resources and shall meet and confer regarding mitigation for such resources in order to comply with California Public Resources Code §21083.2(b).

CULT-2. Human Remains. If human remains are encountered, California Health and Safety Code §7050.5 states that no further disturbance shall occur until the San Bernardino County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code §5097.98(b) remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately identify the "most likely descendants(s)" for purposes of receiving notification of discovery. The most likely descendant(s) shall then make recommendations within 48 hours and engage in consultation concerning the treatment of the remains as provided in Public Resources Code §5097.98.

GEO-1. Prepare and Implement Storm Water Pollution Prevention Plan (SWPPP). Prior to issuance of a Grading or Building Permit, and as part of compliance with the NPDES requirements, a Notice of Intent shall be prepared and submitted to the Santa Ana Regional Water Quality Control Board (RWQCB) providing notification and intent to comply with the State of California General Construction Permit. A copy of the SWPPP shall be available and implemented at the construction site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction site to the “maximum extent practicable.” All recommendations in the Plan shall be implemented during area demolition/preparation, grading, and construction. The Project shall comply with each of the recommendations detailed in the Plan to mitigate potential storm water runoff impacts. Construction Best Management Practices (BMPs) included in the Plan, shall include but not be limited to:

- Construction waste shall be disposed of properly in accordance with applicable federal, state and local regulations. Use appropriately labeled recycling bins to recycle construction materials including solvents, water-based paints, vehicle fluids, broken asphalt and concrete, wood, and vegetation. Non-recyclable materials/wastes shall be taken to an appropriate landfill. Toxic wastes must be discarded at a licensed regulated disposal site.

- Leaks, drips and spills shall be cleaned up immediately to prevent contaminated soil on paved surfaces that can be washed away into the storm drains.
- Pavement shall not be hosed down at material spills. Dry cleanup methods shall be used whenever possible.
- Dumpsters shall be covered and maintained.
- Gravel approaches shall be used where truck traffic is frequent to reduce soil compaction and the tracking of sediment into streets shall be limited.
- Vehicle/equipment maintenance, repair, and washing shall be conducted away from storm drains or exposed soils. Major repairs shall be conducted off-site. Drip pans or drop clothes shall be used to catch drips and spills.
- Regularly water newly graded areas and exposed dirt stockpiles;
- Follow Project SWPPP procedures to prevent sediment and nuisance runoff from entering the drainage.

GEO-2 Paleontological Resources. If unanticipated paleontological resources are unearthed during construction excavations, the contractor shall cease all earth-disturbing activities within a 100-foot radius of the area of discovery until the discovery can be evaluated by a paleontologist to assess the significance of such resources and shall meet with the City Director of Development Services to confer regarding mitigation for such resources in order to comply with California Public Resources Code §5097.5.

HAZ-1. Spill Prevention and Clean-up Best Management Practices. To reduce the potential for materials and pollutants associated with construction to be discharged to the environment, the Project Proponent will implement the following:

- Containment and cleanup equipment (e.g., absorbent pads, mats, socks, granules, drip pans, shovels, and lined clean drums) will be at the staging areas and construction site for use, as needed.
- Staging areas where refueling, storage, and maintenance of equipment occur will not be located within 100 feet of drainages to reduce the potential for contamination by spills.
- Construction equipment will be maintained and kept in good operating condition to reduce the likelihood of line breaks or leakage.
- No refueling or servicing will be done without absorbent material (e.g. absorbent pads, mats, socks, pillows, and granules) or drip pans underneath to contain spilled material. If these activities result in an accumulation of materials on the soil, the soil will be removed and disposed of properly.
- If a spill is detected, construction activity will cease immediately, and the Contractor will immediately react to safely contain and remove spilled materials.
- Spill areas will be restored to pre-spill conditions, as practicable.

HAZ-2. Fire Prevention Best Management Practices. In order to reduce the potential for a wildfire during construction, the Project will implement the following mitigation measures:

- **Comply with Applicable Laws**. Comply with all applicable laws of the State of California.
- **Confine Welding Activity.** Confine welding activity to areas having a minimum radius of ten feet cleared to mineral soil, wet down an area within 25 feet in all directions from welding operations with a 0.3 percent Class A Foam Solution, and utilize a welding tent or metal shield where possible to deflect sparks. Include one shovel and one backpack five-gallon water-filled tank with pump with each welder.

- **Prevent Fire and Extinguish Fires.** Be responsible for preventing the escape of fires as a result of Project construction and have a fully charged fire extinguisher (U.L. rated at 2-A: 10-B: C, or larger) on each truck, personnel vehicle, tractor, grader and other heavy equipment, at all times.
- **Prohibit Smoking.** Under no circumstances shall smoking be permitted while employees are operating light or heavy equipment, or walking or working, near native habitat.
- **Clear Key Areas of Flammable Material.** Equipment service areas, parking areas, and gas and oil storage areas shall be cleared of all flammable material for a radius of at least ten feet. Small mobile or stationary internal combustion engine sites shall be cleared of flammable material for a slope distance of at least 10 feet from such engine.
- **Remove Waste**. The construction contractor shall remove all waste materials from the Project site on a daily basis, as able.
- **Notify 9-1-1.** Construction workers shall notify 9-1-1 of any fires along roads or in or near the Project area as soon as feasible.
- **Maintain Fire Prevention Service Access**. Access roads shall remain open and passable for emergency vehicles at all times.
- **Use Spark Arrestors**. Equip all diesel and/or gasoline-operated engines with spark arresters that meet standards set forth in the National Wildfire Coordinating Group publication for Multi-position Small Engines, #430-1, or General Purpose and Locomotive, #430-2. Spark arrestors are not required on equipment powered by exhaust-driven turbo charged engines or motor vehicles equipped with a maintained muffler.
- **Use Water Tank.** BCVWD or its contractor shall furnish a water truck and/or hose, or a water buffalo attachment, with a pick-up truck at the staging area during construction.

TRAF-1. Traffic Control Measures. At the County's direction, traffic controls will be put in place where deemed necessary, and at least one lane of street will be open at all times for through traffic. Traffic controls will maintain safe traffic flow on local streets affected by construction at all times, including through the use of adequate signage, protective devices, or flag persons to ensure that traffic can flow. Construction road segments will remain without any significant roadway hazards remaining at the end of the construction day.

TRIBE-1. Native American Human Remains. If human remains or funerary objects are encountered during any activities associated with the Project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to California Health and Safety Code §7050.5 and that code enforced for the duration of the Project.

TRIBE-2. Native American Cultural Resources. In the event that Native American cultural resources are discovered during Project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the Project outside of the buffered area may continue during this assessment period.

Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input. The archaeologist shall complete an isolate record for the find and submit this document to the applicant and Lead Agency for dissemination to the San Manuel Band of Mission Indians.

TRIBE-3. Native American Historical Resources. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop a cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

a) All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a Tribal Participant(s).
b) The Lead Agency and/or applicant shall, in good faith, consult with the Tribe on the disposition and treatment of any artifacts or other cultural materials encountered during the Project.

4.0 Consultation and Coordination

The Beaumont Cherry Valley Water District consulted the following individuals, Federal, State, and local agencies, tribes, and other persons during the development of this environmental assessment:

TEAM MEMBERS: Andy Minor, LEED AP; Carmen Gardner, Assistant Environmental Planner

FEDERAL, STATE, AND LOCAL AGENCIES:
Agency Permit/Approval Santa Ana River Regional Water Quality Control Board Section 402 Clean Water Act (CWA) General Construction Permit – Notice of Intent

TRIBES:
The CEQA lead agency, BCVWD, initiated consultation with the Native American Tribes regarding the proposed Project during the week of September 16, 2019. The Tribes responded to the CEQA lead agency's consultation letter indicating the Project is located within ancestral territory and, therefore, is of interest to the Tribe. However, due to the nature and location of the proposed Project, the tribe responded that it does not have any concerns with the Project's implementation, as planned, at this time.

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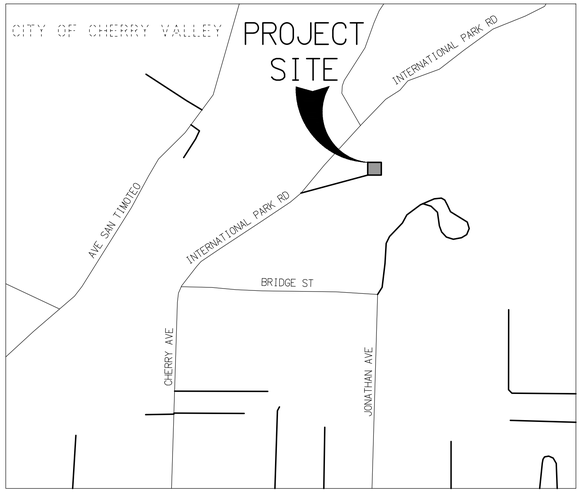
Searl Biological Services (2018, September 10). Biological Inventory for the Beaumont-Cherry Valley Water District's Noble Water Storage Tank No. 2 and Transmission Pipeline.

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Appendices

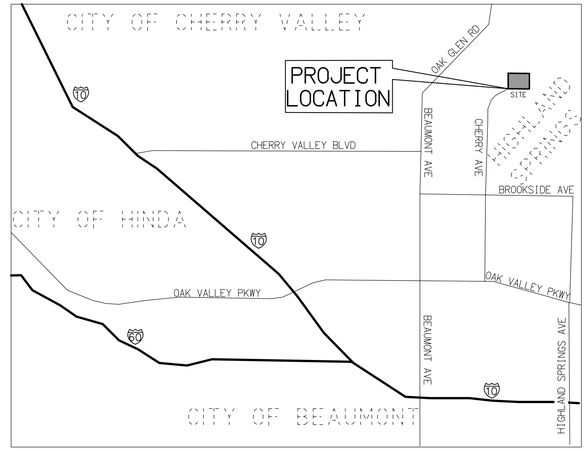
CHERRY VALLEY WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA
PLANS FOR THE CONSTRUCTION OF THE
NOBLE WATER STORAGE TANK II



LOCATION MAP
N.T.S

BOARD OF DIRECTORS

JOHN COVINGTON	PRESIDENT
ANDY RAMIREZ	VICE PRESIDENT
CLAUDEEN DIAZ	SECRETARY
DAVID HOFFMAN	TREASURER
DANIEL SLAWSON	BOARD MEMBER
DANIEL JAGGERS, P.E.	GENERAL MANAGER



VICINTY MAP
N.T.S

ENGINEER'S NOTE TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THESE LOCATIONS ARE APPROXIMATE AND SHALL BE CONFIRMED IN THE FIELD BY A CONTRACTOR SO THAT ANY NECESSARY ADJUSTMENT CAN BE MADE IN ALIGNMENT AND/OR GRADE OF THE PROPOSED IMPROVEMENT. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THIS PLAN. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO THESE LINES OR STRUCTURES.

CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

BENCHMARK

THE BENCHMARK USED IS PER RIVERSIDE COUNTY DATASHEET "DESIGNATION 40-X" STAMPED "40 X R/S"

DESCRIBED BY METRO WATER DISTRICT SO. CALIFORNIA 1992 AT LAKE PERRIS RESERVOIR, AT ENTRANCE GATE TO MWDSC PERRIS PUMPBACK PLANT, ON EASTERLY SIDE OF RAMONA EXPRESSWAY, FOUND 2 1/4 INCH BRASS DISK SET FLUSH, IN TOP OF SOUTHERLY HEADWALL OF CONCRETE DRAIN.

ELEVATION = 1491.80' (NAVD 88)

PROJECT NUMBER 1705500

PROJECT PHASE 1
ISSUE FOR CONSTRUCTION

Cozad & Fox, Inc
CIVIL / STRUCTURAL ENGINEERS
MUNICIPAL CONSULTANTS / PLANNERS
SURVEYORS / GPS
151 SOUTH GIRARD STREET HEMET, CA 92544
TEL. (951) 652-4454 FAX (951) 766-8942
E-MAIL BFOX@KBCOZAD.COM

PREPARED UNDER THE SUPERVISION OF:

DATE:_____

ROBERT L. VESTAL
REGISTERED CIVIL ENGINEER NO. 86258

ENGINEER'S SEAL
REGISTERED PROFESSIONAL ENGINEER
ROBERT L. VESTAL
No. 86258
CIVIL
STATE OF CALIFORNIA

Job No.	
DESIGNED	R.L.V.
DRAWN	D.V.
CHECKED	
APPROVED	R.L.V.
Reg. No.	
Date	

REV	DATE	DESCRIPTION:	BY

Benchmark: SEE SHEET 1

Scale: NONE

BEAUMONT-CHERRY VALLEY WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

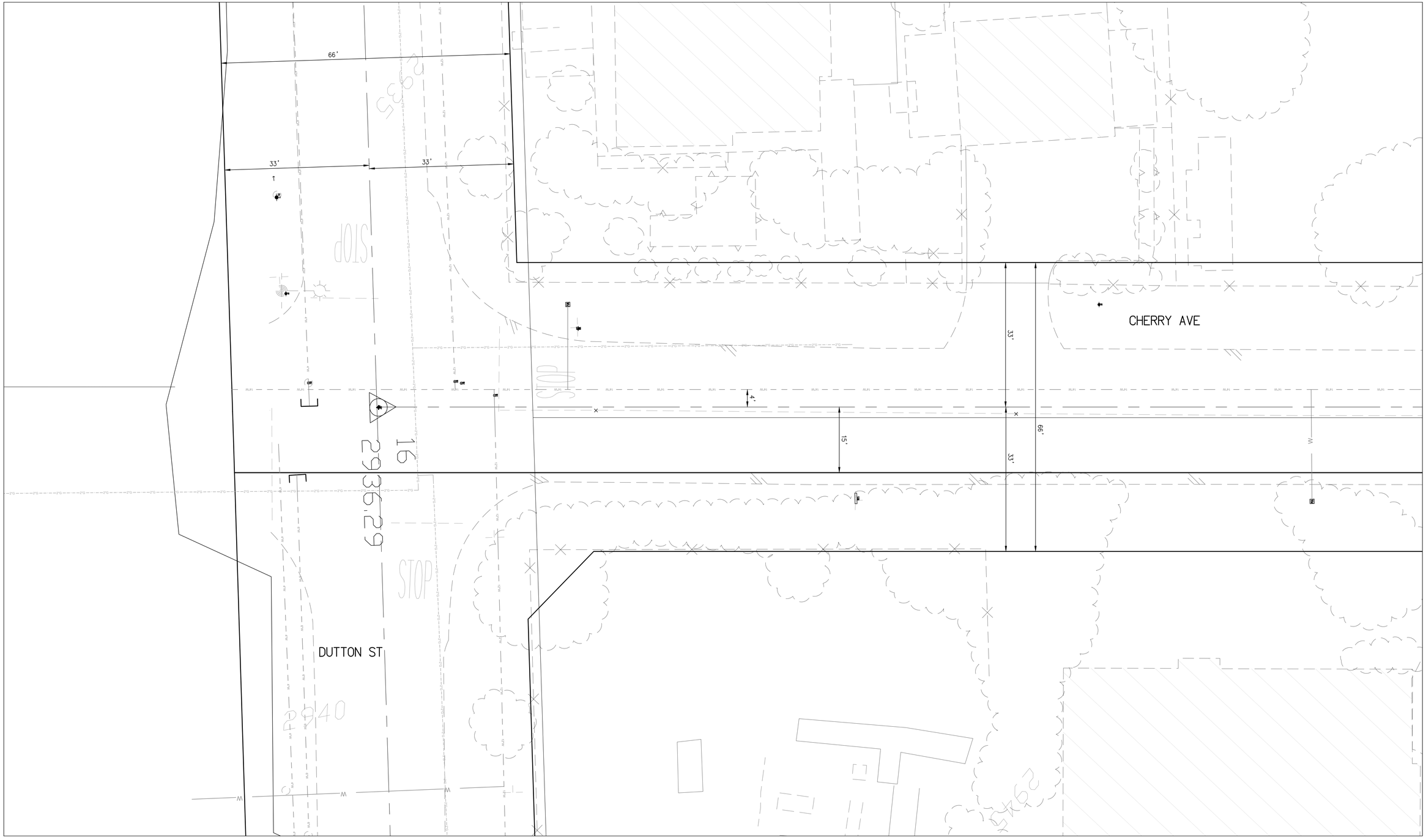
District Engineer _____ R.C.E. No. _____ Date _____

NOBLE WATER STORAGE TANK II

TITLE SHEET

Sheet No. 1 OF 4 SHTS

06/07/2018
DATE



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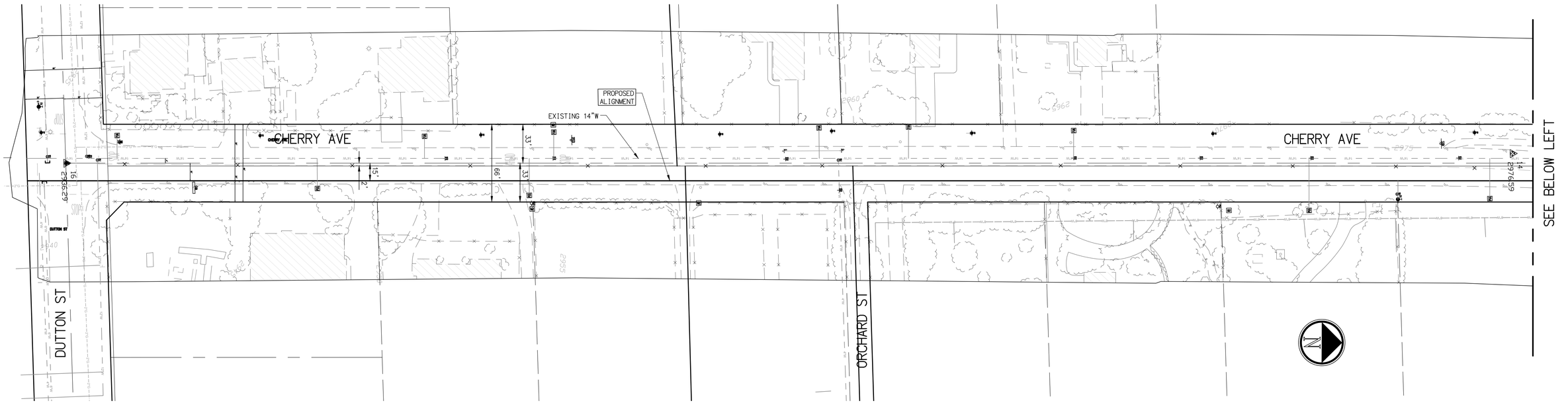
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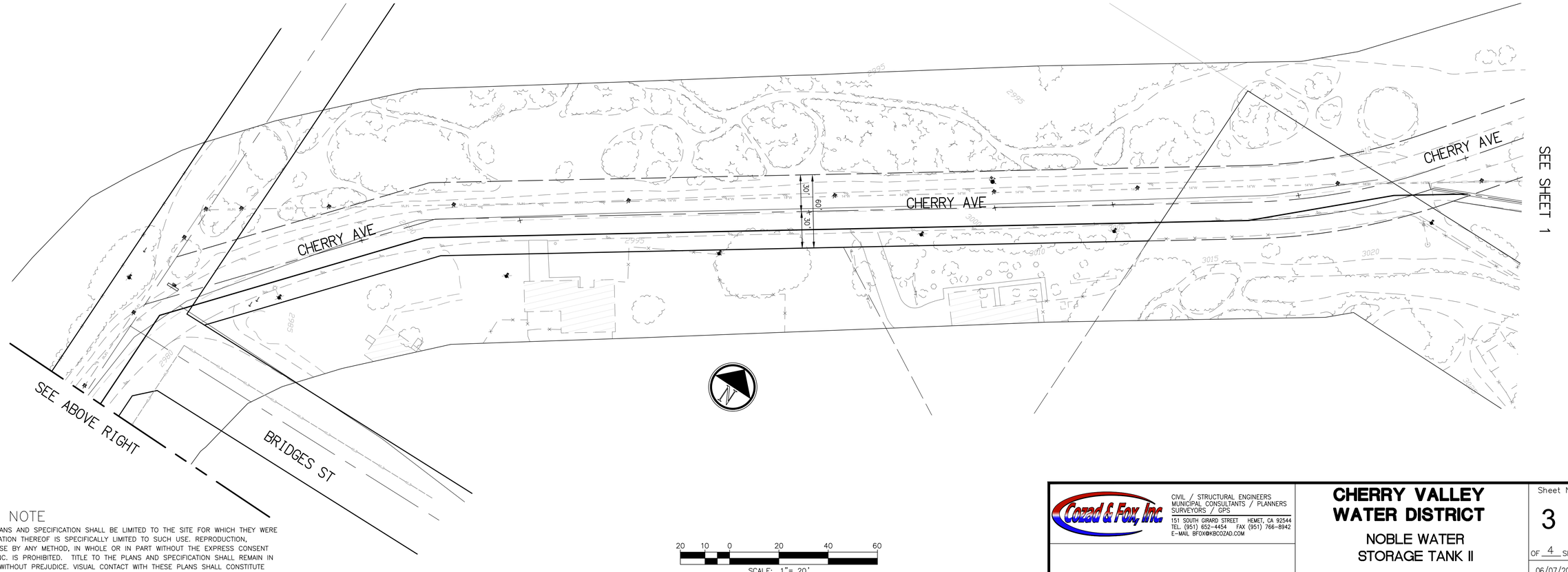
CHERRY VALLEY WATER DISTRICT

NOBLE WATER STORAGE TANK II

Sheet No. 2 OF 4 SHTS

06/07/2018
DATE





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CHERRY VALLEY WATER DISTRICT

NOBLE WATER STORAGE TANK II

Sheet No. 3 OF 4 SHTS

06/07/2018 DATE

ASSUMED LOCATION
EASEMENT IN FAVOR OF PUBLIC OVER ANY EXIST ROADS LYING WITHIN SAID LAND, STREET NAME: NOBLE CANYON ROAD ITEM B2 OF TITLE REPORT
BY LAWYERS TITLE FILE NO: 618650200
DATED: 4/18/18

CHERRY AVE ℄
[R/W]
[R/W]
(E) PAVING
(E) DIRT DWY
INLET
24" RCP
12" RCP
18" RCP
POSSIBLE BASIN
0.28 MG STORAGE
(E) 14" TO BE ABANDONED
12' WIDE GATE
(E) DIRT DRIVEWAY TO BE WIDENED
(E) RV
(E) DIRT DWY
(E) DIRT DWY
(E) 6"
(E) 1MG TANK
70'ø X 36'H
RING = 3036.78
(E) NOBLE REGULATOR
3330 ZONE/3150 ZONE
(E) 12"
3150 ZONE
(E) 12" SD
(E) OUT/IN
IN
(E) NOBLE BOOSTER PUMP TO 3330 ZONE
GRAVEL
24" DIP
6" C&G
6'H SECURITY FENCE
24" ALT VALVE IN VAULT
14" DIP
14" CHECK VALVE IN VAULT
24" DIP
(E) TANK FOUNDATION TO BE REMOVED AND GRADED
30" OVERFLOW & 8" TANK DRAIN
IN
24" CHECK VALVE IN VAULT
24" DIP
OUT
2 MG TANK
100'ø X 36'H
RING=3036.78
APPROXIMATE LOCATION INACTIVE FAULT
(E) BUILDING TO BE DEMOLISHED
℄
3010 3015 3020 3025 3030 3035 3040 3045 3050 3055 3060 3065 3070 3075 3080 3085 3090

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SCALE: 1"= 20'

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CHERRY VALLEY WATER DISTRICT

NOBLE WATER STORAGE TANK II

Sheet No. 4 OF 4 SHTS

06/07/2018 DATE

Noble Water Storage Tank No. 2 and Tranmission Pipeline Project

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	179.39	User Defined Unit	4.12	179,390.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The Project site is 3.97 acres, including tank site and water pipeline.

Construction Phase - Demolition/Site Preparation - 10 days total
Grading - 20 days
Building construction - 35 days
Paving - 25 days

Off-road Equipment - 1 crane, 1 forklift, 1 generator set, 1 tractor/loaders/backhoes, 1 welder

Off-road Equipment - 1 concrete/industrial saw, 3 dumpers/tenders, 1 crane, 1 rubbed tired dozers, 1 tractor/loader/backhoe

Off-road Equipment - 1 grader, 1 watering trucker/rubber tired dozer, 1 tractor/loader/backhoe

Off-road Equipment - Cement and mortar mixers - 1
Pavers - 1
Paving equipment - 1
Rollers - 1
Tractor/loaders/backhoes - 1

Off-road Equipment - 2 dumpers/tenders, 1 rubber tired dozer

Grading - 3.97 acres of impact for grading and/or site preparation

Construction Off-road Equipment Mitigation - Water twice daily during grading

Noble Water Storage Tank No. 2 and Tranmission Pipeline Project - South Coast AQMD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	35.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	25.00
tblGrading	AcresOfGrading	10.00	4.00
tblLandUse	LandUseSquareFeet	0.00	179,390.00
tblLandUse	LotAcreage	0.00	4.12
tblOffRoadEquipment	HorsePower	231.00	158.00
tblOffRoadEquipment	HorsePower	16.00	158.00
tblOffRoadEquipment	LoadFactor	0.29	0.38
tblOffRoadEquipment	OffRoadEquipmentType	Excavators	Cranes
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblTripsAndVMT	WorkerTripNumber	25.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	3.0759	30.0748	22.3158	0.0375	6.3236	1.5442	7.4096	3.3568	1.4390	4.3559	0.0000	3,684.0796	3,684.0796	0.9631	0.0000	3,708.1573
2020	0.8921	8.4017	9.2086	0.0148	0.1453	0.4614	0.6067	0.0385	0.4254	0.4639	0.0000	1,419.5213	1,419.5213	0.4098	0.0000	1,429.7655
Maximum	**3.0759**	**30.0748**	**22.3158**	**0.0375**	**6.3236**	**1.5442**	**7.4096**	**3.3568**	**1.4390**	**4.3559**	**0.0000**	**3,684.0796**	**3,684.0796**	**0.9631**	**0.0000**	**3,708.1573**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	3.0759	30.0748	22.3158	0.0375	2.8948	1.5442	3.9808	1.5236	1.4390	2.5227	0.0000	3,684.0796	3,684.0796	0.9631	0.0000	3,708.1573
2020	0.8921	8.4017	9.2086	0.0148	0.1453	0.4614	0.6067	0.0385	0.4254	0.4639	0.0000	1,419.5213	1,419.5213	0.4098	0.0000	1,429.7655
Maximum	**3.0759**	**30.0748**	**22.3158**	**0.0375**	**2.8948**	**1.5442**	**3.9808**	**1.5236**	**1.4390**	**2.5227**	**0.0000**	**3,684.0796**	**3,684.0796**	**0.9631**	**0.0000**	**3,708.1573**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.00**	**0.00**	**42.77**	**53.99**	**0.00**	**38.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.0093	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.0093**	**1.7000e-004**	**0.0184**	**0.0000**	**0.0000**	**7.0000e-005**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**7.0000e-005**		**0.0393**	**0.0393**	**1.1000e-004**	**0.0000**	**0.0419**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.0093	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.0093**	**1.7000e-004**	**0.0184**	**0.0000**	**0.0000**	**7.0000e-005**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**7.0000e-005**		**0.0393**	**0.0393**	**1.1000e-004**	**0.0000**	**0.0419**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/4/2019	2/15/2019	5	10	
2	Grading	Grading	2/18/2019	3/15/2019	5	20	
3	Building Construction	Building Construction	3/22/2019	5/9/2019	5	35	
4	Paving	Paving	2/6/2020	3/11/2020	5	25	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Noble Water Storage Tank No. 2 and Tranmission Pipeline Project - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Dumpers/Tenders	3	8.00	158	0.38
Demolition	Cranes	1	8.00	158	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1		97	0.37
Demolition	Excavators	3	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	6.00	132	0.36
Paving	Rollers	1	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	10	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	75.00	29.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9799	30.0077	21.5861	0.0355		1.5426	1.5426		1.4376	1.4376		3,485.2416	3,485.2416	0.9569		3,509.1640
Total	**2.9799**	**30.0077**	**21.5861**	**0.0355**		**1.5426**	**1.5426**		**1.4376**	**1.4376**		**3,485.2416**	**3,485.2416**	**0.9569**		**3,509.1640**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	**0.0960**	**0.0672**	**0.7297**	**2.0000e-003**	**0.2012**	**1.5700e-003**	**0.2028**	**0.0534**	**1.4400e-003**	**0.0548**		**198.8380**	**198.8380**	**6.2100e-003**		**198.9933**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9799	30.0077	21.5861	0.0355		1.5426	1.5426		1.4376	1.4376	0.0000	3,485.2416	3,485.2416	0.9569		3,509.1640
Total	**2.9799**	**30.0077**	**21.5861**	**0.0355**		**1.5426**	**1.5426**		**1.4376**	**1.4376**	**0.0000**	**3,485.2416**	**3,485.2416**	**0.9569**		**3,509.1640**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	**0.0960**	**0.0672**	**0.7297**	**2.0000e-003**	**0.2012**	**1.5700e-003**	**0.2028**	**0.0534**	**1.4400e-003**	**0.0548**		**198.8380**	**198.8380**	**6.2100e-003**		**198.9933**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2342	0.0000	6.2342	3.3331	0.0000	3.3331			0.0000			0.0000
Off-Road	2.1149	23.6733	11.6880	0.0234		1.0853	1.0853		0.9985	0.9985		2,321.7231	2,321.7231	0.7346		2,340.0873
Total	**2.1149**	**23.6733**	**11.6880**	**0.0234**	**6.2342**	**1.0853**	**7.3195**	**3.3331**	**0.9985**	**4.3316**		**2,321.7231**	**2,321.7231**	**0.7346**		**2,340.0873**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415
Total	**0.0427**	**0.0299**	**0.3243**	**8.9000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**88.3725**	**88.3725**	**2.7600e-003**		**88.4415**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8054	0.0000	2.8054	1.4999	0.0000	1.4999			0.0000			0.0000
Off-Road	2.1149	23.6733	11.6880	0.0234		1.0853	1.0853		0.9985	0.9985	0.0000	2,321.7231	2,321.7231	0.7346		2,340.0873
Total	**2.1149**	**23.6733**	**11.6880**	**0.0234**	**2.8054**	**1.0853**	**3.8907**	**1.4999**	**0.9985**	**2.4984**	**0.0000**	**2,321.7231**	**2,321.7231**	**0.7346**		**2,340.0873**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415
Total	**0.0427**	**0.0299**	**0.3243**	**8.9000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**88.3725**	**88.3725**	**2.7600e-003**		**88.4415**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6339	14.1318	10.7457	0.0184		0.7955	0.7955		0.7579	0.7579		1,750.7411	1,750.7411	0.3653		1,759.8736
Total	**1.6339**	**14.1318**	**10.7457**	**0.0184**		**0.7955**	**0.7955**		**0.7579**	**0.7579**		**1,750.7411**	**1,750.7411**	**0.3653**		**1,759.8736**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1168	3.3206	0.8934	7.3000e-003	0.1856	0.0223	0.2079	0.0534	0.0214	0.0748		778.1172	778.1172	0.0570		779.5411
Worker	0.3999	0.2800	3.0404	8.3200e-003	0.8383	6.5200e-003	0.8449	0.2223	6.0100e-003	0.2283		828.4918	828.4918	0.0259		829.1389
Total	**0.5167**	**3.6006**	**3.9338**	**0.0156**	**1.0239**	**0.0289**	**1.0528**	**0.2758**	**0.0274**	**0.3031**		**1,606.6090**	**1,606.6090**	**0.0828**		**1,608.6800**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6339	14.1318	10.7457	0.0184		0.7955	0.7955		0.7579	0.7579	0.0000	1,750.7411	1,750.7411	0.3653		1,759.8736
Total	**1.6339**	**14.1318**	**10.7457**	**0.0184**		**0.7955**	**0.7955**		**0.7579**	**0.7579**	**0.0000**	**1,750.7411**	**1,750.7411**	**0.3653**		**1,759.8736**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1168	3.3206	0.8934	7.3000e-003	0.1856	0.0223	0.2079	0.0534	0.0214	0.0748		778.1172	778.1172	0.0570		779.5411
Worker	0.3999	0.2800	3.0404	8.3200e-003	0.8383	6.5200e-003	0.8449	0.2223	6.0100e-003	0.2283		828.4918	828.4918	0.0259		829.1389
Total	**0.5167**	**3.6006**	**3.9338**	**0.0156**	**1.0239**	**0.0289**	**1.0528**	**0.2758**	**0.0274**	**0.3031**		**1,606.6090**	**1,606.6090**	**0.0828**		**1,608.6800**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8279	8.3584	8.7301	0.0134		0.4603	0.4603		0.4243	0.4243		1,280.3738	1,280.3738	0.4058		1,290.5183
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8279**	**8.3584**	**8.7301**	**0.0134**		**0.4603**	**0.4603**		**0.4243**	**0.4243**		**1,280.3738**	**1,280.3738**	**0.4058**		**1,290.5183**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0433	0.4785	1.4000e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		139.1474	139.1474	3.9900e-003		139.2472
Total	**0.0642**	**0.0433**	**0.4785**	**1.4000e-003**	**0.1453**	**1.1000e-003**	**0.1464**	**0.0385**	**1.0200e-003**	**0.0396**		**139.1474**	**139.1474**	**3.9900e-003**		**139.2472**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8279	8.3584	8.7301	0.0134		0.4603	0.4603		0.4243	0.4243	0.0000	1,280.3738	1,280.3738	0.4058		1,290.5183
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8279**	**8.3584**	**8.7301**	**0.0134**		**0.4603**	**0.4603**		**0.4243**	**0.4243**	**0.0000**	**1,280.3738**	**1,280.3738**	**0.4058**		**1,290.5183**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0433	0.4785	1.4000e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		139.1474	139.1474	3.9900e-003		139.2472
Total	**0.0642**	**0.0433**	**0.4785**	**1.4000e-003**	**0.1453**	**1.1000e-003**	**0.1464**	**0.0385**	**1.0200e-003**	**0.0396**		**139.1474**	**139.1474**	**3.9900e-003**		**139.2472**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.0093	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Unmitigated	4.0093	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4556					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.5519					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.7300e-003	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Total	**4.0093**	**1.7000e-004**	**0.0184**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0393**	**0.0393**	**1.1000e-004**		**0.0419**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4556					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.5519					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.7300e-003	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Total	**4.0093**	**1.7000e-004**	**0.0184**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0393**	**0.0393**	**1.1000e-004**		**0.0419**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Noble Water Storage Tank No. 2 and Tranmission Pipeline Project

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	179.39	User Defined Unit	4.12	179,390.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The Project site is 3.97 acres, including tank site and water pipeline.

Construction Phase - Demolition/Site Preparation - 10 days total
Grading - 20 days
Building construction - 35 days
Paving - 25 days

Off-road Equipment - 1 crane, 1 forklift, 1 generator set, 1 tractor/loaders/backhoes, 1 welder

Off-road Equipment - 1 concrete/industrial saw, 3 dumpers/tenders, 1 crane, 1 rubbed tired dozers, 1 tractor/loader/backhoe

Off-road Equipment - 1 grader, 1 watering trucker/rubber tired dozer, 1 tractor/loader/backhoe

Off-road Equipment - Cement and mortar mixers - 1
Pavers - 1
Paving equipment - 1
Rollers - 1
Tractor/loaders/backhoes - 1

Off-road Equipment - 2 dumpers/tenders, 1 rubber tired dozer

Grading - 3.97 acres of impact for grading and/or site preparation

Construction Off-road Equipment Mitigation - Water twice daily during grading

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	35.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	25.00
tblGrading	AcresOfGrading	10.00	4.00
tblLandUse	LandUseSquareFeet	0.00	179,390.00
tblLandUse	LotAcreage	0.00	4.12
tblOffRoadEquipment	HorsePower	231.00	158.00
tblOffRoadEquipment	HorsePower	16.00	158.00
tblOffRoadEquipment	LoadFactor	0.29	0.38
tblOffRoadEquipment	OffRoadEquipmentType	Excavators	Cranes
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblTripsAndVMT	WorkerTripNumber	25.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	3.0680	30.0690	22.3950	0.0376	6.3236	1.5442	7.4096	3.3568	1.4390	4.3559	0.0000	3,697.8196	3,697.8196	0.9636	0.0000	3,721.9082
2020	0.8868	8.3980	9.2616	0.0149	0.1453	0.4614	0.6067	0.0385	0.4254	0.4639	0.0000	1,429.1481	1,429.1481	0.4101	0.0000	1,439.3995
Maximum	**3.0680**	**30.0690**	**22.3950**	**0.0376**	**6.3236**	**1.5442**	**7.4096**	**3.3568**	**1.4390**	**4.3559**	**0.0000**	**3,697.8196**	**3,697.8196**	**0.9636**	**0.0000**	**3,721.9082**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	3.0680	30.0690	22.3950	0.0376	2.8948	1.5442	3.9808	1.5236	1.4390	2.5227	0.0000	3,697.8196	3,697.8196	0.9636	0.0000	3,721.9082
2020	0.8868	8.3980	9.2616	0.0149	0.1453	0.4614	0.6067	0.0385	0.4254	0.4639	0.0000	1,429.1481	1,429.1481	0.4101	0.0000	1,439.3995
Maximum	**3.0680**	**30.0690**	**22.3950**	**0.0376**	**2.8948**	**1.5442**	**3.9808**	**1.5236**	**1.4390**	**2.5227**	**0.0000**	**3,697.8196**	**3,697.8196**	**0.9636**	**0.0000**	**3,721.9082**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.00**	**0.00**	**42.77**	**53.99**	**0.00**	**38.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.0093	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.0093**	**1.7000e-004**	**0.0184**	**0.0000**	**0.0000**	**7.0000e-005**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**7.0000e-005**		**0.0393**	**0.0393**	**1.1000e-004**	**0.0000**	**0.0419**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.0093	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.0093**	**1.7000e-004**	**0.0184**	**0.0000**	**0.0000**	**7.0000e-005**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**7.0000e-005**		**0.0393**	**0.0393**	**1.1000e-004**	**0.0000**	**0.0419**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/4/2019	2/15/2019	5	10	
2	Grading	Grading	2/18/2019	3/15/2019	5	20	
3	Building Construction	Building Construction	3/22/2019	5/9/2019	5	35	
4	Paving	Paving	2/6/2020	3/11/2020	5	25	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Dumpers/Tenders	3	8.00	158	0.38
Demolition	Cranes	1	8.00	158	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1		97	0.37
Demolition	Excavators	3	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	6.00	132	0.36
Paving	Rollers	1	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	10	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	75.00	29.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9799	30.0077	21.5861	0.0355		1.5426	1.5426		1.4376	1.4376		3,485.2416	3,485.2416	0.9569		3,509.1640
Total	**2.9799**	**30.0077**	**21.5861**	**0.0355**		**1.5426**	**1.5426**		**1.4376**	**1.4376**		**3,485.2416**	**3,485.2416**	**0.9569**		**3,509.1640**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	**0.0882**	**0.0613**	**0.8088**	**2.1400e-003**	**0.2012**	**1.5700e-003**	**0.2028**	**0.0534**	**1.4400e-003**	**0.0548**		**212.5780**	**212.5780**	**6.6500e-003**		**212.7442**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9799	30.0077	21.5861	0.0355		1.5426	1.5426		1.4376	1.4376	0.0000	3,485.2416	3,485.2416	0.9569		3,509.1640
Total	**2.9799**	**30.0077**	**21.5861**	**0.0355**		**1.5426**	**1.5426**		**1.4376**	**1.4376**	**0.0000**	**3,485.2416**	**3,485.2416**	**0.9569**		**3,509.1640**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	**0.0882**	**0.0613**	**0.8088**	**2.1400e-003**	**0.2012**	**1.5700e-003**	**0.2028**	**0.0534**	**1.4400e-003**	**0.0548**		**212.5780**	**212.5780**	**6.6500e-003**		**212.7442**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2342	0.0000	6.2342	3.3331	0.0000	3.3331			0.0000			0.0000
Off-Road	2.1149	23.6733	11.6880	0.0234		1.0853	1.0853		0.9985	0.9985		2,321.7231	2,321.7231	0.7346		2,340.0873
Total	**2.1149**	**23.6733**	**11.6880**	**0.0234**	**6.2342**	**1.0853**	**7.3195**	**3.3331**	**0.9985**	**4.3316**		**2,321.7231**	**2,321.7231**	**0.7346**		**2,340.0873**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530
Total	**0.0392**	**0.0273**	**0.3595**	**9.5000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**94.4791**	**94.4791**	**2.9500e-003**		**94.5530**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8054	0.0000	2.8054	1.4999	0.0000	1.4999			0.0000			0.0000
Off-Road	2.1149	23.6733	11.6880	0.0234		1.0853	1.0853		0.9985	0.9985	0.0000	2,321.7231	2,321.7231	0.7346		2,340.0873
Total	**2.1149**	**23.6733**	**11.6880**	**0.0234**	**2.8054**	**1.0853**	**3.8907**	**1.4999**	**0.9985**	**2.4984**	**0.0000**	**2,321.7231**	**2,321.7231**	**0.7346**		**2,340.0873**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530
Total	**0.0392**	**0.0273**	**0.3595**	**9.5000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**94.4791**	**94.4791**	**2.9500e-003**		**94.5530**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6339	14.1318	10.7457	0.0184		0.7955	0.7955		0.7579	0.7579		1,750.7411	1,750.7411	0.3653		1,759.8736
Total	**1.6339**	**14.1318**	**10.7457**	**0.0184**		**0.7955**	**0.7955**		**0.7579**	**0.7579**		**1,750.7411**	**1,750.7411**	**0.3653**		**1,759.8736**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1118	3.3183	0.8022	7.5200e-003	0.1856	0.0220	0.2076	0.0534	0.0210	0.0745		801.0371	801.0371	0.0530		802.3622
Worker	0.3673	0.2556	3.3700	8.9000e-003	0.8383	6.5200e-003	0.8449	0.2223	6.0100e-003	0.2283		885.7418	885.7418	0.0277		886.4343
Total	**0.4791**	**3.5739**	**4.1722**	**0.0164**	**1.0239**	**0.0285**	**1.0524**	**0.2758**	**0.0270**	**0.3028**		**1,686.7789**	**1,686.7789**	**0.0807**		**1,688.7965**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6339	14.1318	10.7457	0.0184		0.7955	0.7955		0.7579	0.7579	0.0000	1,750.7411	1,750.7411	0.3653		1,759.8736
Total	**1.6339**	**14.1318**	**10.7457**	**0.0184**		**0.7955**	**0.7955**		**0.7579**	**0.7579**	**0.0000**	**1,750.7411**	**1,750.7411**	**0.3653**		**1,759.8736**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1118	3.3183	0.8022	7.5200e-003	0.1856	0.0220	0.2076	0.0534	0.0210	0.0745		801.0371	801.0371	0.0530		802.3622
Worker	0.3673	0.2556	3.3700	8.9000e-003	0.8383	6.5200e-003	0.8449	0.2223	6.0100e-003	0.2283		885.7418	885.7418	0.0277		886.4343
Total	**0.4791**	**3.5739**	**4.1722**	**0.0164**	**1.0239**	**0.0285**	**1.0524**	**0.2758**	**0.0270**	**0.3028**		**1,686.7789**	**1,686.7789**	**0.0807**		**1,688.7965**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8279	8.3584	8.7301	0.0134		0.4603	0.4603		0.4243	0.4243		1,280.3738	1,280.3738	0.4058		1,290.5183
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8279**	**8.3584**	**8.7301**	**0.0134**		**0.4603**	**0.4603**		**0.4243**	**0.4243**		**1,280.3738**	**1,280.3738**	**0.4058**		**1,290.5183**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0588	0.0395	0.5315	1.4900e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		148.7743	148.7743	4.2800e-003		148.8812
Total	**0.0588**	**0.0395**	**0.5315**	**1.4900e-003**	**0.1453**	**1.1000e-003**	**0.1464**	**0.0385**	**1.0200e-003**	**0.0396**		**148.7743**	**148.7743**	**4.2800e-003**		**148.8812**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8279	8.3584	8.7301	0.0134		0.4603	0.4603		0.4243	0.4243	0.0000	1,280.3738	1,280.3738	0.4058		1,290.5183
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8279**	**8.3584**	**8.7301**	**0.0134**		**0.4603**	**0.4603**		**0.4243**	**0.4243**	**0.0000**	**1,280.3738**	**1,280.3738**	**0.4058**		**1,290.5183**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0588	0.0395	0.5315	1.4900e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		148.7743	148.7743	4.2800e-003		148.8812
Total	**0.0588**	**0.0395**	**0.5315**	**1.4900e-003**	**0.1453**	**1.1000e-003**	**0.1464**	**0.0385**	**1.0200e-003**	**0.0396**		**148.7743**	**148.7743**	**4.2800e-003**		**148.8812**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.0093	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Unmitigated	4.0093	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4556					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.5519					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.7300e-003	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Total	**4.0093**	**1.7000e-004**	**0.0184**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0393**	**0.0393**	**1.1000e-004**		**0.0419**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4556					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.5519					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.7300e-003	1.7000e-004	0.0184	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0393	0.0393	1.1000e-004		0.0419
Total	**4.0093**	**1.7000e-004**	**0.0184**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0393**	**0.0393**	**1.1000e-004**		**0.0419**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Noble Water Storage Tank No. 2 and Tranmission Pipeline Project

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	179.39	User Defined Unit	4.12	179,390.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The Project site is 3.97 acres, including tank site and water pipeline.

Construction Phase - Demolition/Site Preparation - 10 days total
Grading - 20 days
Building construction - 35 days
Paving - 25 days

Off-road Equipment - 1 crane, 1 forklift, 1 generator set, 1 tractor/loaders/backhoes, 1 welder

Off-road Equipment - 1 concrete/industrial saw, 3 dumpers/tenders, 1 crane, 1 rubbed tired dozers, 1 tractor/loader/backhoe

Off-road Equipment - 1 grader, 1 watering trucker/rubber tired dozer, 1 tractor/loader/backhoe

Off-road Equipment - Cement and mortar mixers - 1
Pavers - 1
Paving equipment - 1
Rollers - 1
Tractor/loaders/backhoes - 1

Off-road Equipment - 2 dumpers/tenders, 1 rubber tired dozer

Grading - 3.97 acres of impact for grading and/or site preparation

Construction Off-road Equipment Mitigation - Water twice daily during grading

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	35.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	25.00
tblGrading	AcresOfGrading	10.00	4.00
tblLandUse	LandUseSquareFeet	0.00	179,390.00
tblLandUse	LotAcreage	0.00	4.12
tblOffRoadEquipment	HorsePower	231.00	158.00
tblOffRoadEquipment	HorsePower	16.00	158.00
tblOffRoadEquipment	LoadFactor	0.29	0.38
tblOffRoadEquipment	OffRoadEquipmentType	Excavators	Cranes
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblTripsAndVMT	WorkerTripNumber	25.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0738	0.6989	0.4895	1.0300e-003	0.0818	0.0330	0.1148	0.0386	0.0309	0.0695	0.0000	92.3406	92.3406	0.0182	0.0000	92.7943
2020	0.0111	0.1050	0.1153	1.8000e-004	1.7800e-003	5.7700e-003	7.5500e-003	4.7000e-004	5.3200e-003	5.7900e-003	0.0000	16.1242	16.1242	4.6500e-003	0.0000	16.2403
Maximum	**0.0738**	**0.6989**	**0.4895**	**1.0300e-003**	**0.0818**	**0.0330**	**0.1148**	**0.0386**	**0.0309**	**0.0695**	**0.0000**	**92.3406**	**92.3406**	**0.0182**	**0.0000**	**92.7943**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0738	0.6989	0.4895	1.0300e-003	0.0475	0.0330	0.0805	0.0202	0.0309	0.0512	0.0000	92.3406	92.3406	0.0182	0.0000	92.7942
2020	0.0111	0.1050	0.1153	1.8000e-004	1.7800e-003	5.7700e-003	7.5500e-003	4.7000e-004	5.3200e-003	5.7900e-003	0.0000	16.1241	16.1241	4.6500e-003	0.0000	16.2403
Maximum	**0.0738**	**0.6989**	**0.4895**	**1.0300e-003**	**0.0475**	**0.0330**	**0.0805**	**0.0202**	**0.0309**	**0.0512**	**0.0000**	**92.3406**	**92.3406**	**0.0182**	**0.0000**	**92.7942**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**41.02**	**0.00**	**28.02**	**46.95**	**0.00**	**24.35**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	2-4-2019	5-3-2019	0.6868	0.6868
2	5-4-2019	8-3-2019	0.0425	0.0425
5	2-4-2020	5-3-2020	0.1162	0.1162
		Highest	0.6868	0.6868

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7316	2.0000e-005	2.3000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4500e-003	4.4500e-003	1.0000e-005	0.0000	4.7500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.7316**	**2.0000e-005**	**2.3000e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.4500e-003**	**4.4500e-003**	**1.0000e-005**	**0.0000**	**4.7500e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7316	2.0000e-005	2.3000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4500e-003	4.4500e-003	1.0000e-005	0.0000	4.7500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.7316**	**2.0000e-005**	**2.3000e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.4500e-003**	**4.4500e-003**	**1.0000e-005**	**0.0000**	**4.7500e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/4/2019	2/15/2019	5	10	
2	Grading	Grading	2/18/2019	3/15/2019	5	20	
3	Building Construction	Building Construction	3/22/2019	5/9/2019	5	35	
4	Paving	Paving	2/6/2020	3/11/2020	5	25	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Dumpers/Tenders	3	8.00	158	0.38
Demolition	Cranes	1	8.00	158	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1		97	0.37
Demolition	Excavators	3	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	6.00	132	0.36
Paving	Rollers	1	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	10	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	75.00	29.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0149	0.1500	0.1079	1.8000e-004		7.7100e-003	7.7100e-003		7.1900e-003	7.1900e-003	0.0000	15.8088	15.8088	4.3400e-003	0.0000	15.9173
Total	**0.0149**	**0.1500**	**0.1079**	**1.8000e-004**		**7.7100e-003**	**7.7100e-003**		**7.1900e-003**	**7.1900e-003**	**0.0000**	**15.8088**	**15.8088**	**4.3400e-003**	**0.0000**	**15.9173**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	3.5000e-004	3.7500e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.9174	0.9174	3.0000e-005	0.0000	0.9181
Total	**4.3000e-004**	**3.5000e-004**	**3.7500e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.9174**	**0.9174**	**3.0000e-005**	**0.0000**	**0.9181**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0149	0.1500	0.1079	1.8000e-004		7.7100e-003	7.7100e-003		7.1900e-003	7.1900e-003	0.0000	15.8088	15.8088	4.3400e-003	0.0000	15.9173
Total	**0.0149**	**0.1500**	**0.1079**	**1.8000e-004**		**7.7100e-003**	**7.7100e-003**		**7.1900e-003**	**7.1900e-003**	**0.0000**	**15.8088**	**15.8088**	**4.3400e-003**	**0.0000**	**15.9173**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	3.5000e-004	3.7500e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.9174	0.9174	3.0000e-005	0.0000	0.9181
Total	**4.3000e-004**	**3.5000e-004**	**3.7500e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.9174**	**0.9174**	**3.0000e-005**	**0.0000**	**0.9181**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0623	0.0000	0.0623	0.0333	0.0000	0.0333	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0212	0.2367	0.1169	2.3000e-004		0.0109	0.0109		9.9800e-003	9.9800e-003	0.0000	21.0623	21.0623	6.6600e-003	0.0000	21.2289
Total	**0.0212**	**0.2367**	**0.1169**	**2.3000e-004**	**0.0623**	**0.0109**	**0.0732**	**0.0333**	**9.9800e-003**	**0.0433**	**0.0000**	**21.0623**	**21.0623**	**6.6600e-003**	**0.0000**	**21.2289**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	3.1000e-004	3.3400e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.8154	0.8154	3.0000e-005	0.0000	0.8161
Total	**3.9000e-004**	**3.1000e-004**	**3.3400e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.8000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.8154**	**0.8154**	**3.0000e-005**	**0.0000**	**0.8161**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0281	0.0000	0.0281	0.0150	0.0000	0.0150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0212	0.2367	0.1169	2.3000e-004		0.0109	0.0109		9.9800e-003	9.9800e-003	0.0000	21.0623	21.0623	6.6600e-003	0.0000	21.2289
Total	**0.0212**	**0.2367**	**0.1169**	**2.3000e-004**	**0.0281**	**0.0109**	**0.0389**	**0.0150**	**9.9800e-003**	**0.0250**	**0.0000**	**21.0623**	**21.0623**	**6.6600e-003**	**0.0000**	**21.2289**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	3.1000e-004	3.3400e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.8154	0.8154	3.0000e-005	0.0000	0.8161
Total	**3.9000e-004**	**3.1000e-004**	**3.3400e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.8000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.8154**	**0.8154**	**3.0000e-005**	**0.0000**	**0.8161**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0286	0.2473	0.1881	3.2000e-004		0.0139	0.0139		0.0133	0.0133	0.0000	27.7943	27.7943	5.8000e-003	0.0000	27.9393
Total	**0.0286**	**0.2473**	**0.1881**	**3.2000e-004**		**0.0139**	**0.0139**		**0.0133**	**0.0133**	**0.0000**	**27.7943**	**27.7943**	**5.8000e-003**	**0.0000**	**27.9393**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9900e-003	0.0592	0.0148	1.3000e-004	3.2000e-003	3.9000e-004	3.5900e-003	9.2000e-004	3.7000e-004	1.2900e-003	0.0000	12.5642	12.5642	8.7000e-004	0.0000	12.5860
Worker	6.3400e-003	5.0300e-003	0.0547	1.5000e-004	0.0144	1.1000e-004	0.0145	3.8200e-003	1.1000e-004	3.9300e-003	0.0000	13.3782	13.3782	4.2000e-004	0.0000	13.3887
Total	**8.3300e-003**	**0.0642**	**0.0696**	**2.8000e-004**	**0.0176**	**5.0000e-004**	**0.0181**	**4.7400e-003**	**4.8000e-004**	**5.2200e-003**	**0.0000**	**25.9424**	**25.9424**	**1.2900e-003**	**0.0000**	**25.9746**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0286	0.2473	0.1881	3.2000e-004		0.0139	0.0139		0.0133	0.0133	0.0000	27.7943	27.7943	5.8000e-003	0.0000	27.9393
Total	**0.0286**	**0.2473**	**0.1881**	**3.2000e-004**		**0.0139**	**0.0139**		**0.0133**	**0.0133**	**0.0000**	**27.7943**	**27.7943**	**5.8000e-003**	**0.0000**	**27.9393**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9900e-003	0.0592	0.0148	1.3000e-004	3.2000e-003	3.9000e-004	3.5900e-003	9.2000e-004	3.7000e-004	1.2900e-003	0.0000	12.5642	12.5642	8.7000e-004	0.0000	12.5860
Worker	6.3400e-003	5.0300e-003	0.0547	1.5000e-004	0.0144	1.1000e-004	0.0145	3.8200e-003	1.1000e-004	3.9300e-003	0.0000	13.3782	13.3782	4.2000e-004	0.0000	13.3887
Total	**8.3300e-003**	**0.0642**	**0.0696**	**2.8000e-004**	**0.0176**	**5.0000e-004**	**0.0181**	**4.7400e-003**	**4.8000e-004**	**5.2200e-003**	**0.0000**	**25.9424**	**25.9424**	**1.2900e-003**	**0.0000**	**25.9746**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0104	0.1045	0.1091	1.7000e-004		5.7500e-003	5.7500e-003		5.3000e-003	5.3000e-003	0.0000	14.5192	14.5192	4.6000e-003	0.0000	14.6342
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0104**	**0.1045**	**0.1091**	**1.7000e-004**		**5.7500e-003**	**5.7500e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**14.5192**	**14.5192**	**4.6000e-003**	**0.0000**	**14.6342**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.3000e-004	5.6000e-004	6.1500e-003	2.0000e-005	1.7800e-003	1.0000e-005	1.8000e-003	4.7000e-004	1.0000e-005	4.9000e-004	0.0000	1.6050	1.6050	5.0000e-005	0.0000	1.6061
Total	**7.3000e-004**	**5.6000e-004**	**6.1500e-003**	**2.0000e-005**	**1.7800e-003**	**1.0000e-005**	**1.8000e-003**	**4.7000e-004**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**1.6050**	**1.6050**	**5.0000e-005**	**0.0000**	**1.6061**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0104	0.1045	0.1091	1.7000e-004		5.7500e-003	5.7500e-003		5.3000e-003	5.3000e-003	0.0000	14.5192	14.5192	4.6000e-003	0.0000	14.6342
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0104**	**0.1045**	**0.1091**	**1.7000e-004**		**5.7500e-003**	**5.7500e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**14.5192**	**14.5192**	**4.6000e-003**	**0.0000**	**14.6342**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.3000e-004	5.6000e-004	6.1500e-003	2.0000e-005	1.7800e-003	1.0000e-005	1.8000e-003	4.7000e-004	1.0000e-005	4.9000e-004	0.0000	1.6050	1.6050	5.0000e-005	0.0000	1.6061
Total	**7.3000e-004**	**5.6000e-004**	**6.1500e-003**	**2.0000e-005**	**1.7800e-003**	**1.0000e-005**	**1.8000e-003**	**4.7000e-004**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**1.6050**	**1.6050**	**5.0000e-005**	**0.0000**	**1.6061**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7316	2.0000e-005	2.3000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4500e-003	4.4500e-003	1.0000e-005	0.0000	4.7500e-003
Unmitigated	0.7316	2.0000e-005	2.3000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4500e-003	4.4500e-003	1.0000e-005	0.0000	4.7500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0832					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6482					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2000e-004	2.0000e-005	2.3000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4500e-003	4.4500e-003	1.0000e-005	0.0000	4.7500e-003
Total	**0.7316**	**2.0000e-005**	**2.3000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.4500e-003**	**4.4500e-003**	**1.0000e-005**	**0.0000**	**4.7500e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0832					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6482					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2000e-004	2.0000e-005	2.3000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4500e-003	4.4500e-003	1.0000e-005	0.0000	4.7500e-003
Total	**0.7316**	**2.0000e-005**	**2.3000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.4500e-003**	**4.4500e-003**	**1.0000e-005**	**0.0000**	**4.7500e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Biological Inventory

Beaumont-Cherry Valley Water District
Noble Water Storage Tank No. 2 and Transmission Pipeline



Prepared For:
Beaumont-Cherry Valley Water District

Prepared By:
Searl Biological Services

Report Date:
October 25, 2019

BIOLOGICAL INVENTORY FOR THE NOBLE WATER STORAGE TANK NO. 2 AND TRANSMISSION PIPELINE

LOCATED IN TOWNSHIP 2 SOUTH, RANGE 1 WEST IN SECTIONS 22, 23, 26, AND 27 OF THE BEAUMONT 7.5 MINUTE UNITED STATES GEOLOGICAL SURVEY

FIELD SURVEY DATE: June 8, 2018 and August 3, 2018
AREA ASSESSED: Proposed Project Area plus 500-foot Buffer

Prepared for:

Beaumont-Cherry Valley Water District (Lead Agency)
560 Magnolia Avenue
Beaumont, CA 92223

Prepared by:

SEARL BIOLOGICAL SERVICES

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Biological Inventory was to identify biological resources present on, and within 500-feet of the proposed Noble Water Storage Tank No. 2 and Transmission Pipeline (Project), and to determine if the Project could potentially impact, either directly or indirectly, identified biological resources.

1.2 Project Location

The Project was located in the Cherry Valley area along Cherry Avenue between Avenida Altura Bella and Dutton Street. *Figure 1 – Regional Map* (Page 2) and *Figure 2 - Vicinity Map* (Page 3) depict the general location of the Project.

The Project was geographically located in Township 2 South, Range 1 West in Sections 22, 23, 26, and 27 of the Beaumont 7.5 Minute United States Geological Survey (USGS) California Quadrangle. *Figure 3 - USGS Topographic Map* (Page 4) depicts the Project's geographic location.

1.3 Project Description

Existing Noble Tank No. 1 is one of two tanks that serve the 3040 Potable Water Pressure Zone, (the "3040" is the operating hydraulic grade line in the pressure zone relative to mean sea level). The existing Noble zone (3040), supplied by the District's base pressure zone (2750), has a need for increased storage capacity to satisfy system demands created by near term development activity. The existing zone is fed by the existing Noble tank as well as the existing Highland Springs tank which each have a storage volume of 1 Million Gallons (MG). The existing Noble tank is located on Cherry Avenue just south of the Avenida Altura Bella and Cherry Avenue intersection in the Community of Cherry Valley. In accordance with the Water Facilities Master Plan, the proposed improvements include:

1. Constructing a 2 MG Steel Storage tank at a high-water level of 3040-feet.
2. Constructing approximately 2,800-feet of 20-inch Ductile Iron Pipe transmission main.
3. Abandonment and demolition of the existing original Noble tank concrete pad located southerly of the existing Noble Tank No. 1 to make space for Noble Tank No. 2.
4. Possible construction of a 0.28 MG Storage Basin.

The Project area is depicted on *Figure 4 – Project Map* (Page 5). A detailed Site Plan has been included in Appendix A.

2.0 REGULATORY SETTING

Onsite natural resources or those with a high occurrence probability in the project area may require mitigation for impacts that would, or could, result from project development. Mitigation requirements are based on numerous federal, state, and local laws, regulations, and policies relating to listed and endangered plants and wildlife, migratory and nesting birds, environmental quality, and lake- or streambed alteration. The following discussion reviews these policies and how they pertain to any tasks implemented under the project.



FIGURE 1
Regional Map

BSEARL BIOLOGICAL SERVICES

N W E S

0 10 20 40 Miles

1:1,000,000

DATE: August 16, 2018
COORDINATE SYSTEM: NAD 1983 UTM Zone 11
SOURCE: ESRI World Streets Map

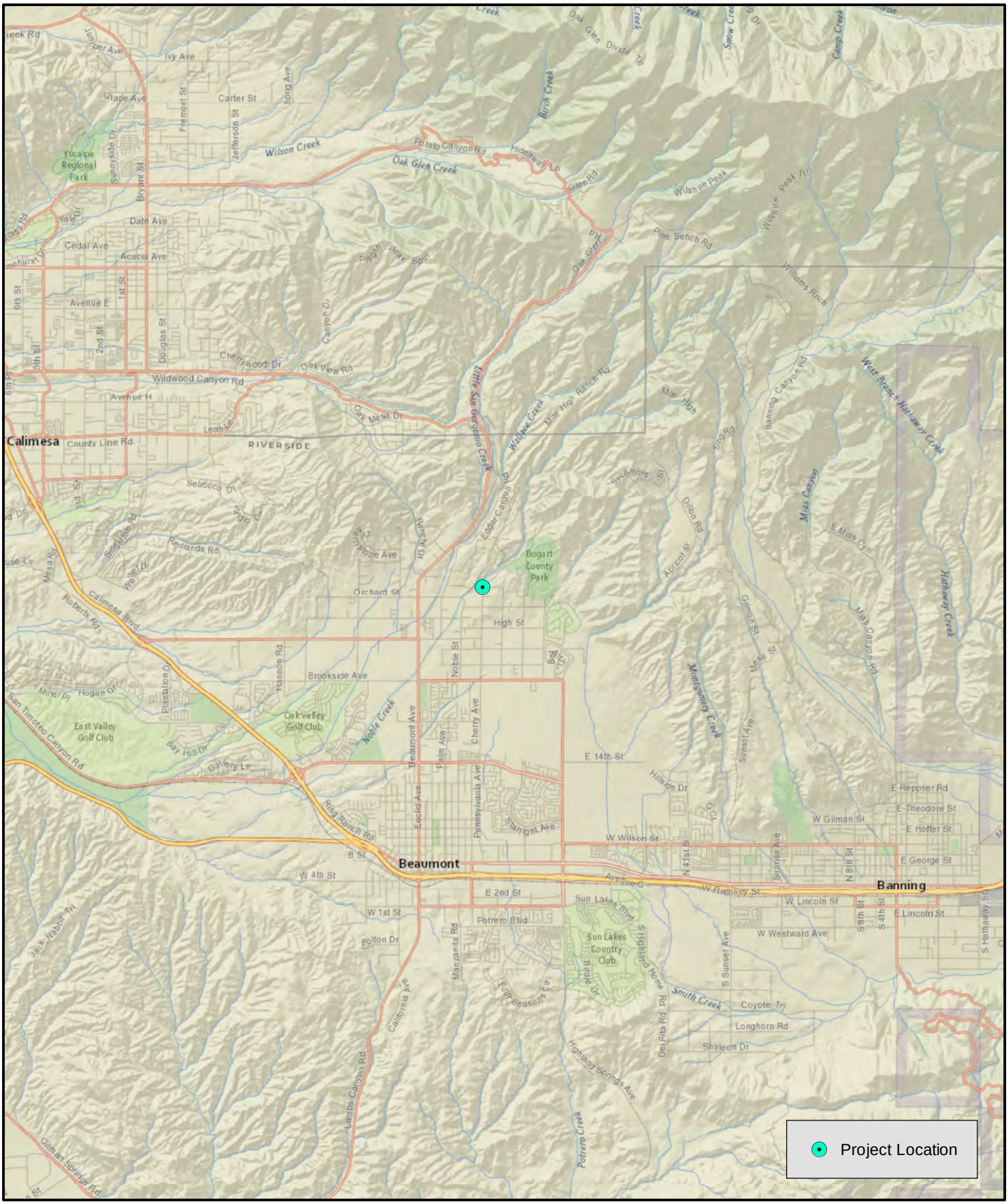


FIGURE 2
Vicinity Map

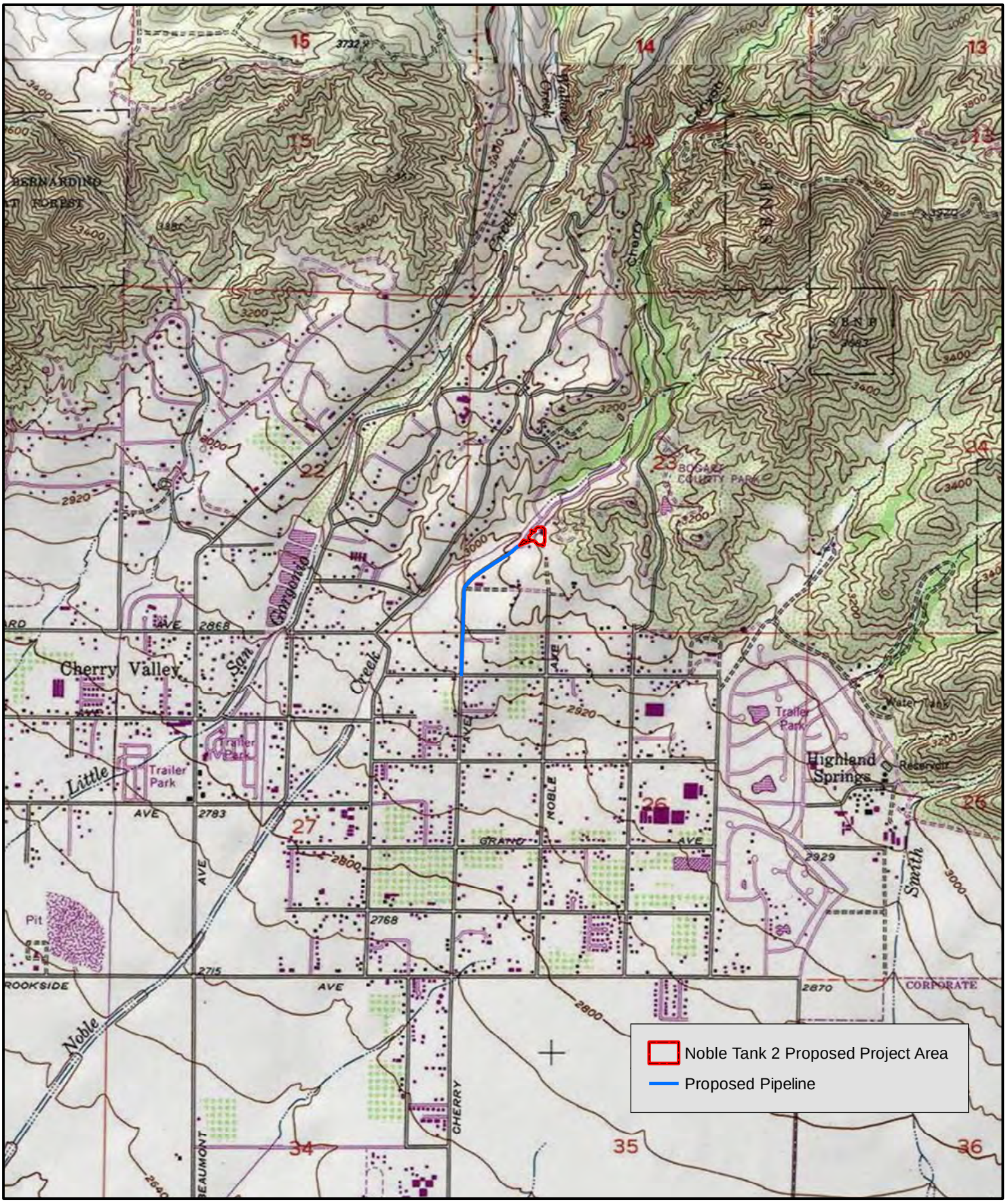
BSEARL BIOLOGICAL SERVICES

N
W E
S

0 1 2 4 Miles

1:100,000

DATE: August 16, 2018
COORDINATE SYSTEM: NAD 1983 UTM Zone 11
SOURCE: ESRI National Geographic World Map



N
W E
S

0 0.25 0.5 1 Miles

1:24,000

FIGURE 3
USGS Topographic Map

DATE: January 30, 2018
COORDINATE SYSTEM: NAD 1983 State Plane California VI FIPS 0406 Feet
SOURCE: ESRI USA Topo Maps and Geovironment



BSEARL BIOLOGICAL SERVICES

N W E S

0 125 250 500 750 1,000 Feet

1:5,000

FIGURE 4
Project Area

DATE: August 16, 2018
COORDINATE SYSTEM: NAD 1983 State Plane California VI FIPS 0406 Feet
SOURCE: ESRI Imagery, ESRI Transportation, Geovironment

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

The U.S. Congress passed the Endangered Species Act (ESA) in 1973 to protect endangered species and species threatened with extinction (federally listed species). The ESA operates in conjunction with the National Environmental Policy Act to help protect the ecosystems upon which endangered and threatened species depend.

Section 9 of the ESA prohibits the "take" of endangered or threatened wildlife species. The legal definition of "take" for the ESA is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 United States Code [USC] 1532 [19]). Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns (50 Code of Federal Regulations [CFR] 17.3). Harassment is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns (50 CFR 17.3). Actions that result in take can result in civil or criminal penalties.

The ESA authorizes the United States Fish and Wildlife Service (USFWS) to issue permits under Sections 7 and 10 of that act. Section 7 mandates that all federal agencies consult with the USFWS for terrestrial species and/or National Marine Fisheries Service (NMFS) for marine species to ensure that federal agency actions do not jeopardize the continued existence of a listed species or adversely modify critical habitat for listed species. Any anticipated adverse effects require preparation of a biological assessment to determine potential effects of the project on listed species and critical habitat. If the project adversely affects a listed species or its habitat, the USFWS or NMFS prepares a Biological Opinion (BO). The BO may recommend "reasonable and prudent alternatives" to the project to avoid jeopardizing or adversely modifying habitat including "take" limits.

Sections 7 and 10 of the ESA include provisions to authorize take that is incidental to, but not the purpose of activities that are otherwise lawful. Federal agencies may seek permitting under Section 7 of the ESA. Under Section 10(a)(1)(B), USFWS may issue permits (incidental take permits) for take of ESA-listed species to non-federal agencies if the take is incidental and does not jeopardize the survival and recovery of the species. To obtain an incidental take permit, an applicant must submit a habitat conservation plan outlining steps to minimize and mitigate permitted take impacts to listed species.

The ESA defines critical habitat as habitat deemed essential to the survival of a federally listed species. The ESA requires the federal government to designate "critical habitat" for any species it lists under the ESA. Under Section 7, all federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species, or destroy or adversely modify its designated critical habitat. These complementary requirements apply only to federal agency actions, and the latter only to specifically designated habitat. A critical habitat designation does not set up a preserve or refuge, and applies only when federal funding, permits, or projects are involved. Critical habitat requirements do not apply to activities on private land that does not involve a federal agency.

2.1.2 Clean Water Act

The federal Clean Water Act (CWA) provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

The United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (EPA) regulate discharge of dredged or fill material into traditional navigable waters (TNW) of the United States under Section 404 of the CWA. The general definition of navigable waters of the U.S. includes those waters of the U.S. that are subject to the ebb and flow of the tide shoreward to the mean high-water mark and/or are presently used or have been used in the past, or may be susceptible to use, to transport interstate or foreign commerce. "Discharges of fill material" are defined as the addition of fill material into waters of the U.S., including, but not limited to the following: placement of fill that is necessary for the construction of any structure or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines (33 CFR 328.2(f)). Additionally, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the U.S. to obtain a certification that the discharge will comply with applicable effluent limitations and water quality standards. Jurisdictional waters of the U.S. include jurisdictional wetlands as well as all other waters of the U.S. such as creeks, ponds, and intermittent drainages. Wetlands are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE 1987). The majority of jurisdictional wetlands in the United States meet three wetland assessment criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. Jurisdictional waters of the U.S. can also be defined by exhibiting a defined bed and bank and ordinary high-water mark (OHWM). As discussed in Regulatory Framework, jurisdictional waters of the U.S. are subject to Section 404 of CWA and are regulated by the USACE.

The USACE authorizes certain fill activities under the Section 404 Nationwide Permit (NWP) Program. Activities required for crossings of waters of the United States associated with the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/ 3- acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for

construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

NWPs do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species or that may affect properties listed or eligible for listing in the National Register of Historic Places (56 Federal Register [FR] 59134, November 22, 1991). In addition to conditions outlined under each NWP, project-specific conditions may be required by the USACE as part of the Section 404 permitting process.

Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the EPA (33 CFR § 328.3 (a)(8) added by 58 FR 45,035, August 25, 1993).

On January 9, 2001, the U.S. Supreme Court issued a decision in Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001) (SWANCC) that held that the language of the CWA cannot be interpreted as conferring authority for the federal government to regulate "isolated, intrastate, and non-navigable waters" merely because migratory birds may frequent them. The Court emphasized the states' responsibility for regulating such waters.

In response to the Court's decisions in Rapanos v. United States and Carabell v. United States, the USACE and the EPA issued joint guidance regarding USACE jurisdiction over waters of the U.S. under the CWA in 2008. Updated guidance in light of these cases and SWANCC was issued in 2011. The guidance summarizes the Supreme Court's findings and provides how and when the USACE should apply the "significant nexus" test in its jurisdictional determinations. This test determines whether a waterway is substantially connected to a TNW tributary and thus falls within USACE jurisdiction. The guidance provides the factors and summarizes the significant nexus test as an assessment of "the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters." Flow characteristics include the volume, duration, and frequency of the flow. Additionally, ecological factors should be included, such as the shared hydrological and biological characteristics between a tributary and an adjacent wetland.

2.1.3 Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA), first enacted in 1918, prohibits any person, unless permitted by regulations, to

…pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatsoever, receive

for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention … for the protection of migratory birds ... or any part, nest, or egg of any such bird. (16 USC 703)

The list of migratory birds includes nearly all bird species native to the United States, and the statute was extended in 1974 to include parts of birds, as well as eggs and nests. The Migratory Bird Treaty Reform Act of 2004 further defined species protected under the act and excluded all non-native species. Thus, it is illegal under MBTA to directly kill, or destroy a nest of, nearly any native bird species, not just endangered species. Activities that result in removal or destruction of an active nest (a nest with eggs or young) would violate the MBTA. Removal of unoccupied nests and bird mortality resulting indirectly from disturbance activities are not considered violations of the MBTA.

2.1.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668–668c), enacted in 1940, and amended several times since, prohibits "taking" Bald Eagle (*Haliaeetus leucocephalus*) and Golden Eagle (*Aquila chrysaetos*), including their parts, nests, or eggs without a permit issued by the Secretary of the Interior.

The act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

In 2009, new USFWS rules were implemented requiring all activities that may disturb or incidentally take an eagle or its nest as a result of an otherwise legal activity to obtain permits from the USFWS.

Under USFWS rules (16 U.C.C. § 22.3; 72 Federal Register 31,132, June 5, 2007), "disturb" means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

2.2 State Regulations

2.2.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) was adopted in 1970 and applies to actions directly undertaken, financed or permitted by State or local government lead agencies. CEQA requires that a project's effects on environmental resources be analyzed and assessed using criteria determined by the lead agency. CEQA defines a rare species in a broader sense than the definitions of threatened, endangered, or California species of concern. Under this definition, the California

Department of Fish and Wildlife (CDFW) can request additional consideration of species not otherwise protected.

2.1.1 CEQA Significance Criteria

Section 15064.7 of the CEQA guidelines encourages local agencies to develop and publish the thresholds that the agency will use in determining the significance of environmental effects caused by projects or actions under its review. Appendix G of the CEQA guidelines provides thresholds to evaluate impacts that would normally be considered significant. Based upon these guidelines, impacts to biological resources would normally be considered significant if the project:

1. Has 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 CDFW or USFWS;
2. Has a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the CDFW or USFWS;
3. Has a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
4. Interferes substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedes the use of native wildlife nursery sites; or
5. Conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or conflicts with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

An evaluation of whether an impact to biological resources would be significant must consider both the resource itself and how that resource fits into a regional or local context. Significant impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. The evaluation of impacts considers direct impacts, indirect impacts, cumulative impacts, as well as temporary and permanent impacts.

2.2.2 California Endangered Species Act

The CDFW administers the California Endangered Species Act (CESA), which prohibits the "taking" of listed species except as otherwise provided in state law.

Section 86 of Fish and Game Code defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Under certain circumstances, the CESA applies these take prohibitions to species petitioned for listing (state candidates). Pursuant to the requirements of the CESA, state lead agencies (as defined under CEQA Public Resources Code Section 21067) are required to consult with the CDFW to ensure that any action or project is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat. Additionally, the CDFW encourages

informal consultation on any proposed project that may impact a candidate species. The CESA requires the CDFW to maintain a list of threatened and endangered species. The CDFW also maintains a list of candidates for listing under the CESA and of species of special concern (or watch list species).

2.2.3 Fully Protected Species

The California Fish and Game Code provides protection from take for a variety of species, referred to as fully protected species. Section 5050 lists protected amphibians and reptiles, and Section 3515 prohibits take of fully protected fish species. Eggs and nests of fully protected birds are under Section 3511. Migratory nongame birds are protected under Section 3800, and mammals are protected under Section 4700. Except for take related to scientific research, all take of fully protected species is prohibited.

2.2.4 CDFW Species of Special Concern

The CDFW defines a Species of Special Concern (SSC) as "a species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

- is extirpated from the State or, in the case of birds, is extirpated in its primary season or breeding role;
- is listed as Federally-, but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed;
- is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status;
- has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status."

SSC species are typically addressed through the CEQA process.

2.2.5 Nesting Birds and Raptors

Section 3503 of the Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 provides protection for all birds of prey, including their eggs and nests.

2.2.6 Migratory Bird Protection

Take or possession of any migratory non-game bird as designated in the MBTA is prohibited by Section 3513 of the Fish and Game Code.

2.2.7 Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (Fish and Game Code Section 1900-1913) directed the then-California Department of Fish and Game (now CDFW) to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as

"endangered" or "rare" and protected endangered and rare plants from take. The NPPA thus includes measures to preserve, protect, and enhance rare and endangered native plants.

CESA has largely superseded NPPA for all plants designated as endangered by the NPPA. The NPPA nevertheless provides limitations on take of rare and endangered species as follows: "...no person will import into this state, or take, possess, or sell within this State" any rare or endangered native plant, except in compliance with provisions of the CESA. Individual land owners are required to notify the CDFW at least 10 days in advance of changing land uses to allow the CDFW to salvage any rare or endangered native plant material.

2.2.8 Lakes and Streambeds

Sections 1601 through 1616 of the Fish and Game Code prohibit alteration of any lake or streambed under CDFW jurisdiction, including intermittent and seasonal channels and many artificial channels, without execution of a Lake and Streambed Alteration Agreement (LSA) through the CDFW. This applies to any channel modifications that would be required to meet drainage, transportation, or flood control objectives of a project.

2.2.9 California Porter-Cologne Water Quality Act

The Regional Water Quality Control Board (RWQCB) regulates discharge of waste in any region that could affect the Waters of the State under the California Porter-Cologne Water Quality. Under the Porter- Cologne Act, a Report of Waste Discharge must be submitted prior to discharging waste, or proposing to discharge waste, within any region that could affect the quality of the Waters of the State (California Water Code Section 13260). Waste Discharge Requirements (WDRs) or a waiver of WDRs will then be issued by the RWQCB. Waters of the State are defined as any surface water or groundwater, including saline waters that are within the boundaries of the state (California Codes: Public Resource Code Section 71200). This differs from the CWA definition of waters of the U.S. by its inclusion of groundwater and waters outside the ordinary high-water mark in its jurisdiction.

2.3 Local Policies

2.3.1 Western Riverside County Multiple Species Habitat Conservation Plan

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) "...is a comprehensive, multi-jurisdictional Habitat Conservation Plan (HCP) focusing on Conservation of species and their associated Habitats in Western Riverside County". The MSHCP encompasses approximately 1.26 million acres of land that stretches from the crest of the San Jacinto Mountains west to the Orange County boundary and includes all unincorporated Riverside County land, as well as the jurisdictional areas of the Cities of Temecula, Murrieta, Lake Elsinore, Canyon Lake, Norco, Corona, Riverside, Moreno Valley, Banning, Beaumont, Calimesa, Perris, Hemet, and San Jacinto Ultimately, the MSHCP will result in the conservation of more than 500,000 acres (347,000 acres on existing Public/Quasi-Public Lands [PQP] and 153,000 of Additional Reserve Lands [ARL]) that focuses on the 146-species covered by the MSHCP.

The MSHCP is a criteria-based plan of which the County's General Plan Area Plan boundaries were utilized to provide the broad organizational framework for the criteria. A Conceptual Reserve Design (CRD) was sketched for each Area Plan using vegetation, planning species occurrence

data, and biological issues and considerations as the primary criteria for the CRD. Subsequent to sketching the CRD, USGS quarter sections (i.e., approximate 160-acre cells) were then overlain on the CRD such that each "Criteria Cell" is an area in real space with a legal description. Criteria Cells were then either aggregated into a Criteria Cell Group or retained as individual Criteria Cells based upon the level of conservation and configuration of the Criteria Cell or Criteria Cell Group. Criteria Cells were assigned an identification number and each Criteria Cell Group was assigned a letter code. Conservation Criteria was drafted for each Criteria Cell or Criteria Cell Group to provide an explicit description of the areas to be targeted for conservation. Those areas located outside of the designated Criteria Cells and/or Criteria Cell Groups are not targeted to be included within the 153,000 acres of ARL.

2.3.1.1 Beaumont-Cherry Valley Water District MSHCP Requirements

The BCVWD is not a permittee under the provisions and requirements of the MSHCP; however, any project proposed by the BCVWD within the jurisdiction of the MSHCP must demonstrate under Section 15064.7 of the CEQA guidelines that it does not:

> *Conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or conflicts with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.*

2.4 Other Applicable Regulatory Policies

2.4.1 California Native Plant Society

The California Native Plant Society (CNPS) is a 501(c) 3 non-profit. The CNPS leads efforts to review and rank the rarity of California's rare plants through the implementation of the CNPS Rare Plant Ranking system (CRPR). This is an iterative and scientifically-vetted process made possible through a community of scientists and volunteers working throughout the state. The CRPR ranks plants from 1 to 4 with 1 being the highest level of endangerment and 4 being a "watch list" or lowest level of endangerment. The CRPR ranks are defined below:

- CRPR 1A - Plants presumed extirpated in California and either rare or extinct elsewhere
- CRPR 1B - Plants rare, threatened, or endangered in California and elsewhere
- CRPR 2A - Plants presumed extirpated in California but common elsewhere
- CRPR 2B - Plants rare, threatened, or endangered in California but more common elsewhere
- CRPR 3 - Review List: Plants about which more information is needed
- CRPR 4 - Watch List: Plants of limited distribution

In addition to the CRPR, each plant is designated with a Threat Rank. The Threat Ranks are as follows:

- 0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- 0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

- 0.3-Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

CRPR 1 and 2 plants must be addressed under CEQA. CRPR 3 plants "should" be addressed under CEQA and CRPR 4 plants are "highly recommended" to be addressed under CEQA per the CNPS.

3.0 METHODS

3.1 Regulatory-Status Species Queries

Prior to initiating the biological reconnaissance surveys, Searl Biological Services (SBS) queried the Geographic Information Systems (GIS) data from the California Natural Diversity Database (CNDDB) and the USFWS Carlsbad Fish and Wildlife Office (CFWO) "Species Occurrence Data" to determine which regulatory-status species have been documented within three miles of the Project. Only federal and state protected species, including CDFW SSC animals, were selected in the query. Watch List species were not included.

3.2 Biological Reconnaissance Surveys

Prior to conducting the biological reconnaissance surveys, SBS created both paper and electronic field maps utilizing GIS. ArcGIS Collector, a field mapping application, was utilized during the biological reconnaissance survey to accurately assess the biological resources on and within 500-feet of the Project.

Biologist Tim Searl conducted the initial biological reconnaissance survey on June 8, 2018. Tim Searl and field technician Marc Searl, conducted an update biological reconnaissance survey on August 3, 2018. Weather data (i.e., temperature and wind speed) was recorded at the start and end of the survey. The Project was transected on foot to the extent feasible while abiding all trespassing laws and all areas were scanned utilizing 10x42 binoculars. All flora[1] and fauna detected were documented and have been included in this document as Appendix B and Appendix C. Vegetation communities/land covers present within 500-feet of the Project were mapped during the biological reconnaissance surveys.

3.3 Vegetation Communities/Land Covers

Vegetation community classifications are typically conducted in accordance with the CDFW Vegetation Classification and Mapping Program (VegCAMP) *List of Vegetation Alliances and Associations* (Natural Communities List) (California Department of Fish and Wildlife, 2010) and *A Manual of California Vegetation* (Sawyer, Keeler-Wolf, & Evens, 2009). Some land cover types are not classified in said sources (i.e., developed, disturbed, agriculture, etc.); therefore, each land cover is designated with a common name for the purpose of this report.

[1] All native and naturalized flora was identified to the extent feasible within 500-feet of the Project. Ornamental plants in parkways and residential areas were not included.

4.0 RESULTS

4.1 Regulatory-Status Species Queries

A total of 12 regulatory-status species have been documented to occur within three miles of the Project. The CNDDB and CFWO results are detailed in the tables below. The locations of the occurrence are depicted on *Figure 5 – CNDDB Query Results* (Page 16) and *Figure 6 – CFWO Query Results* (Page 17).

4.1.1 CNDDB

Table 1 - CNDDB Query Results

Species	Regulatory-Status	Number of Occurrences	Year(s) of Occurrence
Jaeger's milk-vetch (*Astragalus pachypus* var. *jaegeri*)	CRPR 1B.1	1	1897
Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)	SSC	2	1939, 2016
northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)	SSC	2	2002, 2016
Parry's spineflower (*Chorizanthe parryi* var. *parryi*)	CRPR 1B.1	2	2004, 2008
Purple Martin (*Progne subis*)	SSC (Nesting only)	1	1910
Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*)	Federally Endangered State Endangered CRPR 1B.1	1	1923
smooth tarplant (*Centromadia pungens* ssp. *laevis*)	CRPR 1B.1	1	Unknown
Southern Rubber Boa (*Charina umbratica*)	State Threatened	2	1970s[2], 1995
spiny-hair blazing star (*Mentzelia tricuspis*)	CRPR 2B.1	1	1886
Stephens' kangaroo rat (*Dipodomys stephensi*)	Federally Endangered State Threatened	1	1939
western yellow bat (*Lasiurus xanthinus*)	SSC	1	1989
Yucaipa onion (*Allium marvinii*)	CRPR 1B.2	2	1921, 1993

4.1.2 CFWO

Table 2 - CFWO Query Results

Species	Regulatory-Status	Number of Occurrences	Year(s) of Occurrence
Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)	SSC	5	2003, 2014

4.2 Biological Reconnaissance Surveys

Weather during each survey was conducive for conducting a biological survey as presented in Table 3 below. The results of the surveys are presented below.

[2] No exact date provided. CNDDB lists date as 197XXXXX.

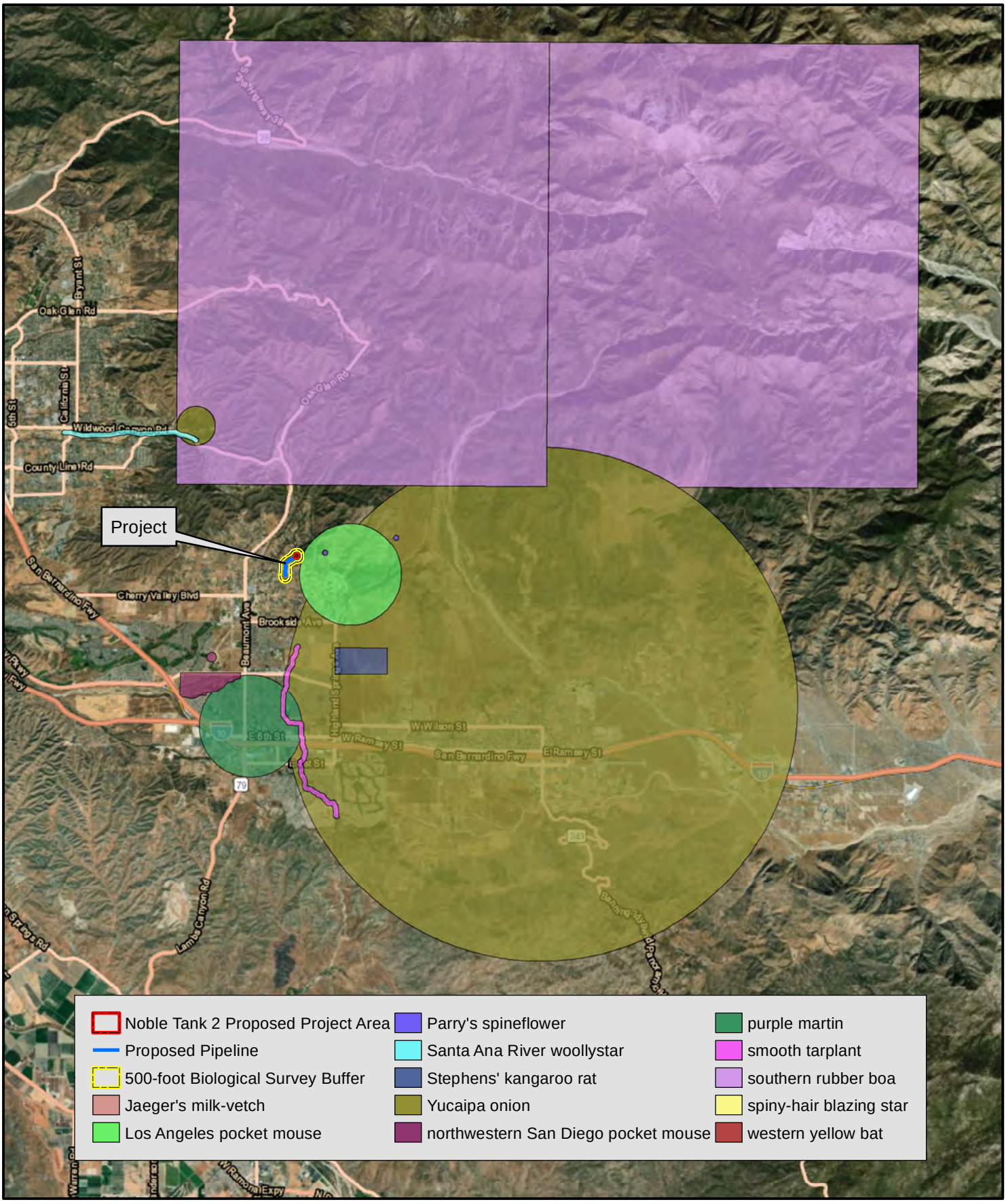
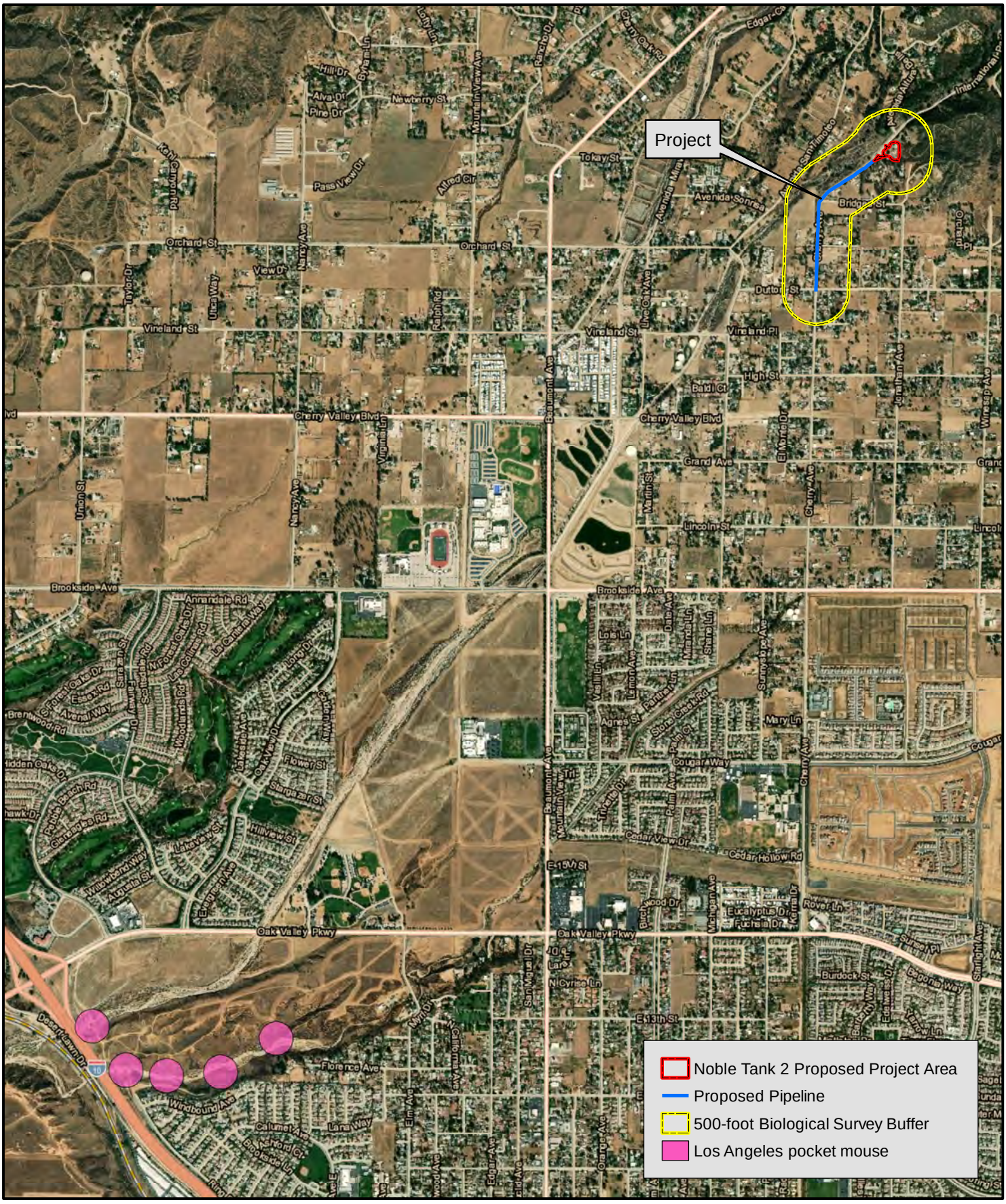


FIGURE 5
CNDDB Query Results

DATE: August 16, 2018
COORDINATE SYSTEM: NAD 1983 State Plane California VI FIPS 0406 Feet
SOURCE: ESRI Imagery, ESRI Transportation, Geovironment, CNDDB Aug. 2018 Data



BSEARL BIOLOGICAL SERVICES

FIGURE 6
CFWO Query Results

DATE: August 16, 2018
COORDINATE SYSTEM: NAD 1983 State Plane California VI FIPS 0406 Feet
SOURCE: ESRI Imagery, ESRI Transportation, Geovironment,
CFWO Species Occurrence June 2018 Data

Table 3 - Survey Weather Data

Date	Surveyor(s)	Start/End Time	Temperature (°F)	Wind Speed (mph)
June 8, 2018	Tim Searl	0800-1100	66-82	1-3
August 3, 2018	Tim Searl Marc Searl	0630-1000	67-84	1-4

4.2.1 Vegetation Communities/Land Covers

A total of eight vegetation communities/land covers were identified and mapped within 500-feet of the Project. Three vegetation communities/land covers were present within the Project area with the majority of those areas consisting of developed/disturbed landcovers. The table below details which vegetation communities/land covers were present, its respective VegCAMP classification if applicable, a brief description of each land cover focused on dominant plant species composition, and the acreage. *Figure 7 – Vegetation/Land Covers* (Page 20) depicts the distribution of each land cover within 500-feet of the Project. *Figure 8 – Noble Tank Area 2 Vegetation/Land Covers* (Page 21) provides a detailed view of the Noble Tank Area 2 portion of the Project. Photographs taken during the biological reconnaissance survey are included in Appendix D, and the location and direction of each is depicted on Figures 7 and 8.

Table 4 – Vegetation/Land Covers

Common Name	VegCAMP Community	Description	Acres	
			Noble Tank 2 Area	500-foot Buffer
Coast Live Oak	No Corresponding VegCAMP Classification	Coast Live Oak consisted of individual immature and mature coast live oak (*Quercus agrifolia*) trees that did not have an interconnected tree canopy.	0.09	0.36
Coast Live Oak Woodland	*Quercus agrifolia* 71.060.02	Coast Live Oak Woodland was located on a north-facing slope and consisted of coast live oak trees with a dense interconnected tree canopy.	0	0.82
Coast Live Oak/Western Sycamore Riparian Woodland	*Quercus agrifolia – Platanus racemosa – Salix laevigata* 71.060.43	This vegetation community was present within the jurisdictional boundary of Noble Creek. It consisted of a dense tree canopy of coast live oak, western sycamore (*Platanus racemosa*), and red willow (*Salix laevigata*).	0	2.68
Coastal Sage Scrub	*Eriogonum fasciculatum* 32.040.02	Coastal Sage Scrub was present east of Noble Tank 2 Area and consisted of dense sage scrub species with California buckwheat (*Eriogonum fasciculatum*) dominant. Due to the dense shrub layer, very few non-native ruderal areas were present.	0	4.18
Coastal Sage Scrub/Coast Live Oak Riparian Woodland/Mulefat Scrub	*Eriogonum fasciculatum* 32.040.02	This mixed community was present west/northwest of the Project primarily within the jurisdictional boundary of Noble Creek. California buckwheat was dominant with scattered coast live oaks and western sycamores. The low-flow drainage course was sparsely vegetated with mulefat (*Baccharis salicifolia*) scrub.	0	16.07

Common Name	VegCAMP Community	Description	Acres	
			Noble Tank 2 Area	500-foot Buffer
Developed/Disturbed/ Ornamental/Ruderal	No Corresponding VegCAMP Classification	This combined land cover encompassed the man-made areas and was the dominant land cover present. Developed areas included homes, paved roadways, hardscape, and existing Noble Tank 1. Disturbed areas consisted of unimproved roadways. Ornamental was the planted vegetation associated with homes and included plants such as Eucalyptus and Oleander. Ruderal areas were those consisting of naturalized non-native vegetation such as ripgut grass (*Bromus diandrus*), red brome (*Bromus madritensis* subsp. *rubens*), and prickly lettuce (*Lactuca serriola*) that were routinely maintained for weed abatement.	0.77	61.04
Pine	No Corresponding VegCAMP Classification	The two pines present were Coulter pine (*Pinus coulteri*). It was uncertain if these were planted or present naturally.	0	0.11
Ruderal/Coastal Sage Scrub	*Bromus rubens* – mixed herbs 42.024.02/ *Eriogonum fasciculatum* 32.040.02	This was a mixed land cover of both naturalized non-native vegetation and coastal sage scrub similar to those described above. The sage scrub was more open and the open areas consisted of ruderal vegetation.	0.36	2.17

4.2.2 Survey Results

The Project was primarily located within Developed/Disturbed/Ruderal areas. The majority of the proposed pipeline alignment was beneath Cherry Avenue within existing asphalt areas. The Noble Tank 2 Area was primarily within Developed/Disturbed/Ruderal areas with some remnant sage scrub around Noble Tank 1 and the eastern edge of the Project area. No regulatory-status flora or fauna were detected during the biological reconnaissance surveys. No potentially jurisdictional areas were within the proposed Project area.

4.2.2.1 Coast Live Oak

Three mature[3], two immature[4], and two emergent[5] coast live oak trees were present within or immediately adjacent to the Project area. Five of these trees were present within or near the Noble Tank 2 Area and two were located near the proposed pipeline alignment. *Figure 9 – Project Area Coast Live Oaks* (Page 22) depicts the location of each coast live oak potentially affected by the Project.

[3] Large, aged trees with large trunk diameter and furrowed bark
[4] Small, young trees with small trunk diameter and smooth bark
[5] Freshly emergent trees

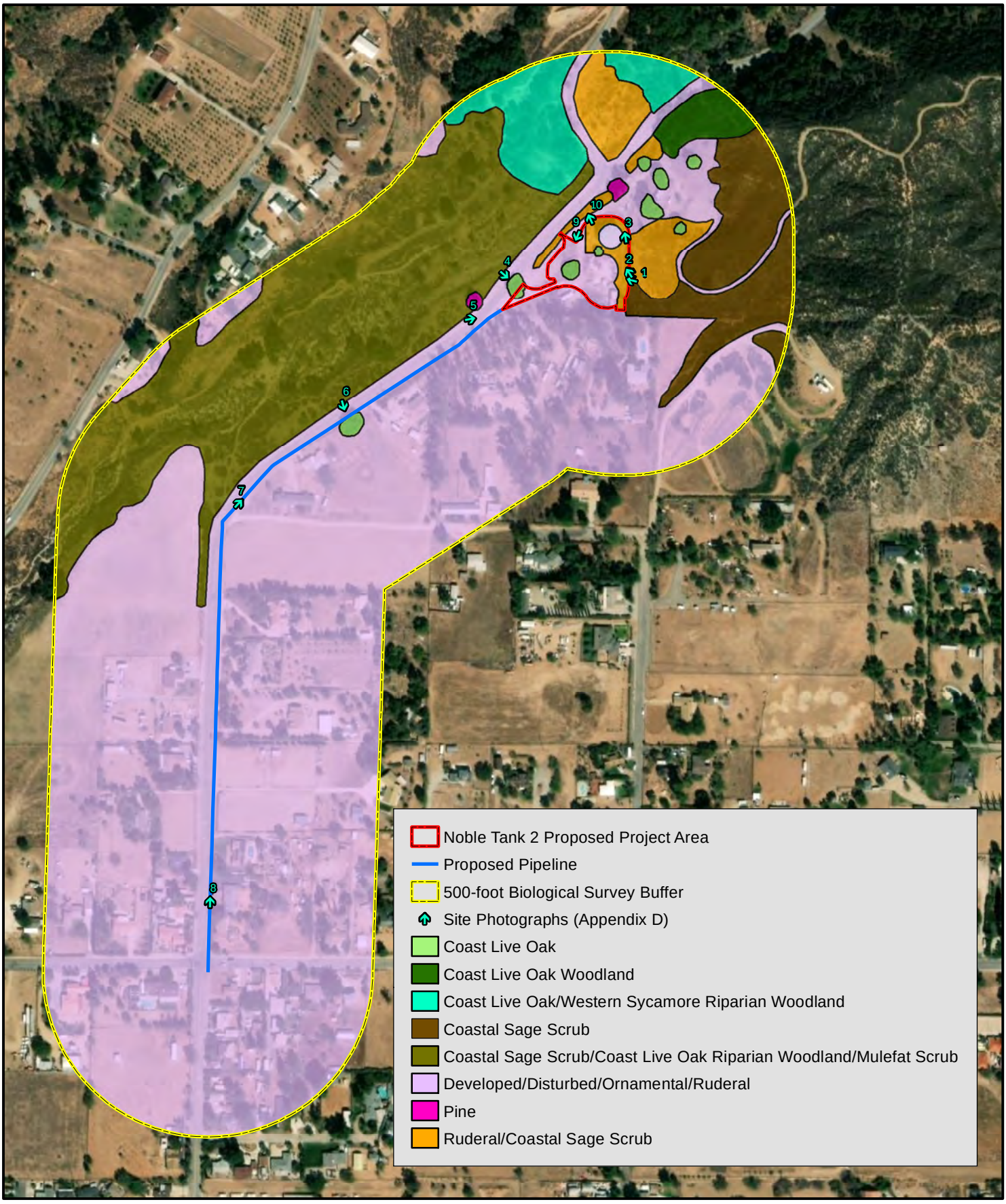
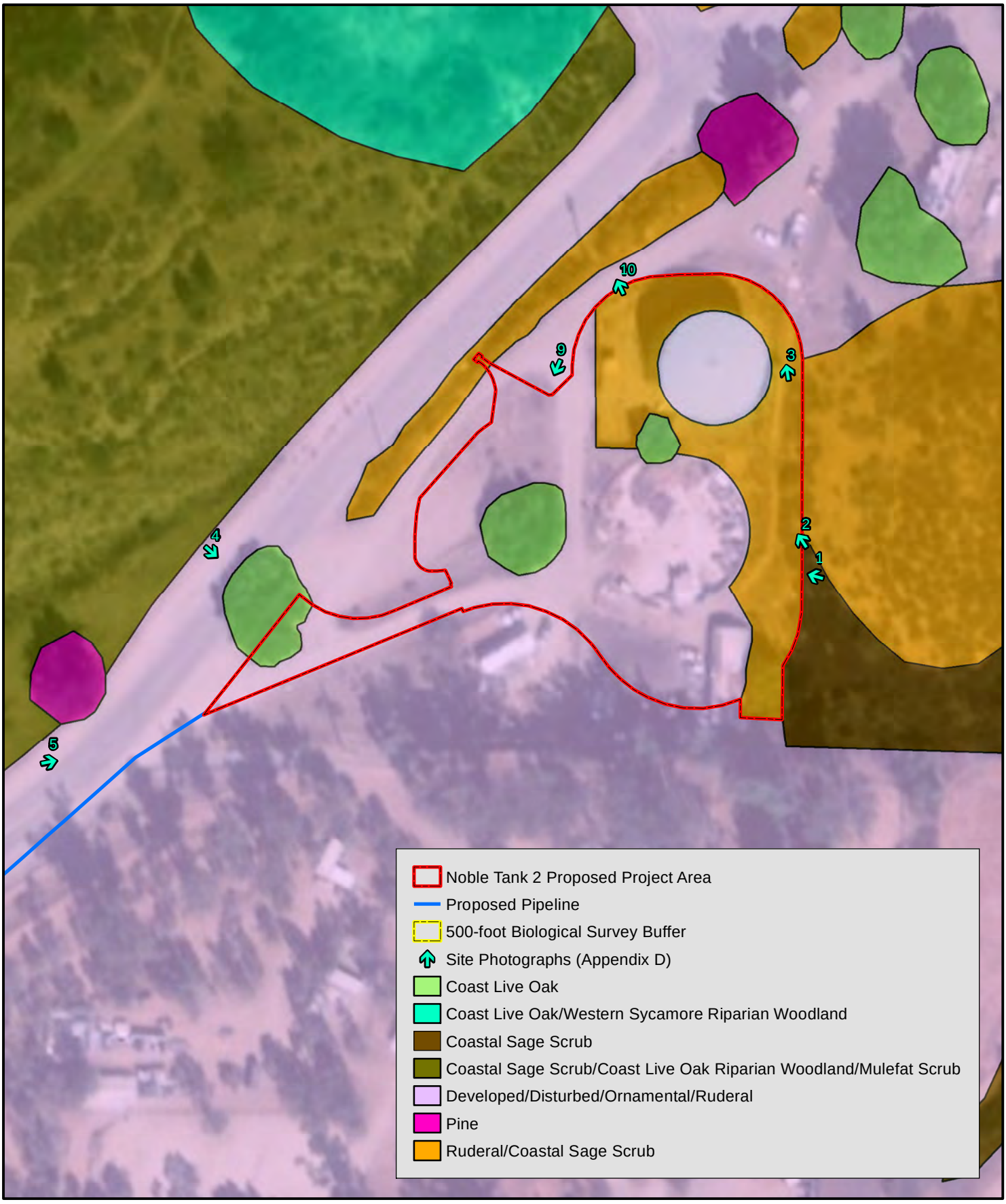


FIGURE 7
Vegetation/Land Covers

DATE: August 17, 2018
COORDINATE SYSTEM: NAD 1983 State Plane California VI FIPS 0406 Feet
SOURCE: ESRI Imagery, Geovironment, Searl Biological Services



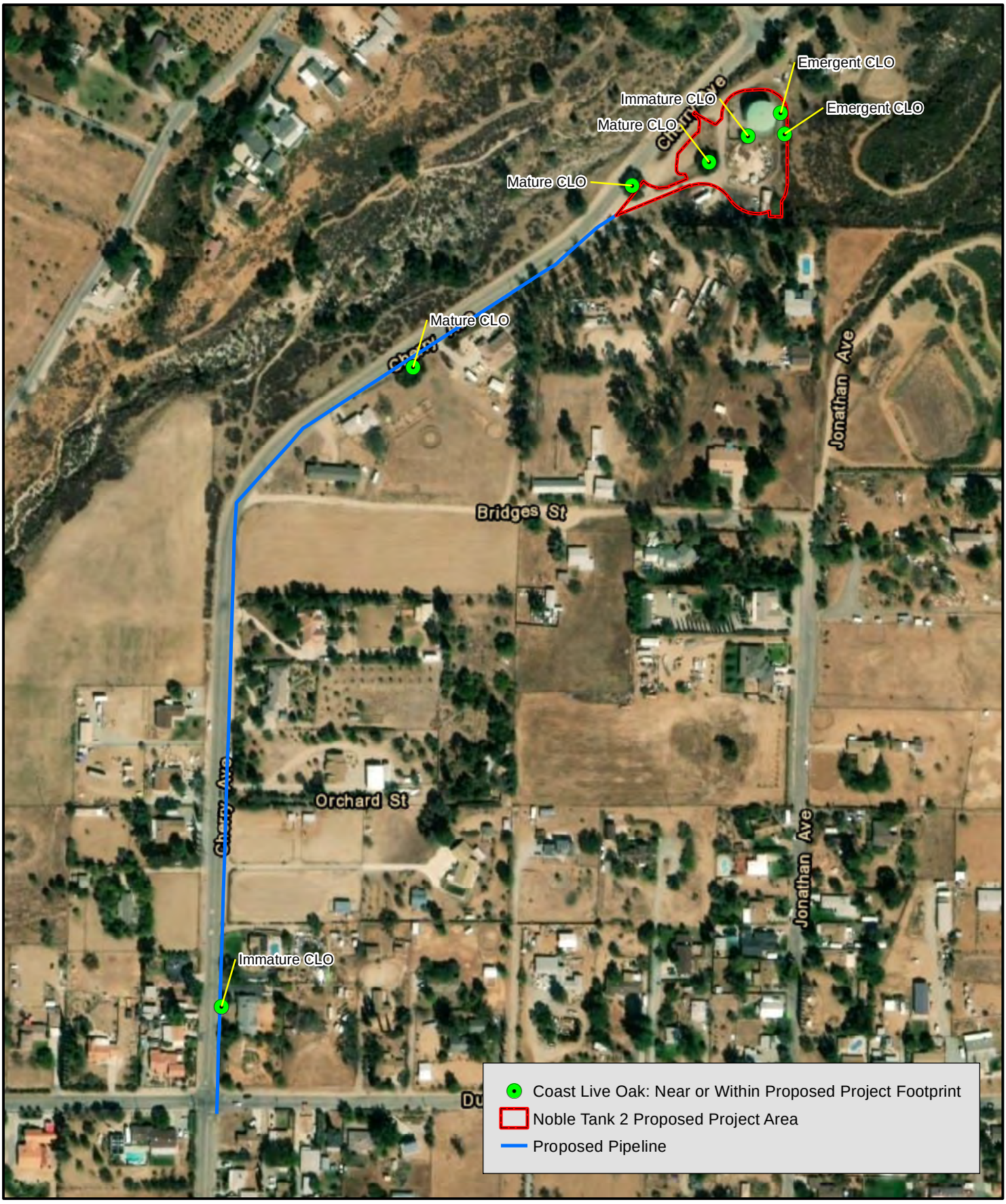
SEARL BIOLOGICAL SERVICES

N
W E
S

0 25 50 100 150 200
Feet

FIGURE 8
Noble Tank Area 2
Vegetation/Land Covers

DATE: August 17, 2018
COORDINATE SYSTEM: NAD 1983 State Plane California VI FIPS 0406 Feet
SOURCE: ESRI Imagery, Geovironment, Searl Biological Services



BSEARL BIOLOGICAL SERVICES

N W E S

0 100 200 400 600 800 Feet

FIGURE 9
Project Area
Coast Live Oaks

DATE: September 7, 2018
COORDINATE SYSTEM: NAD 1983 State Plane California VI FIPS 0406 Feet
SOURCE: ESRI Imagery, Geovironment, Searl Biological Services

4.2.2.2 Noble Creek

Though no jurisdictional areas were within the proposed Project area, Noble Creek, a USGS-designated intermittent stream (i.e., blue-line), was present within 500-feet of the Project both north and west of Cherry Avenue as depicted by *Figure 10 – Noble Creek* (Page 24). The Project will not directly impact Noble Creek.

4.3 Western Riverside County MSHCP

The Project was located in the Pass Area Plan within Subunit 2: Badlands/San Bernardino National Forest of the MSHCP. The majority of the Project was located within the southern portion of Criteria Cell Group D which was targeting long-term conservation, or ARL, in the northern portion of the Criteria Cell Group. A portion of the Project was also located within a MSHCP-designated assessment area for two Narrow Endemic Plants; many-stemmed dudleya (*Dudleya multicaulis*) and Yucaipa onion (*Allium marvinii*). The Project area does not support suitable habitat (i.e., clay soils and rock outcrops) for those two species.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The Project was primarily located in Developed/Disturbed/Ruderal areas with only remnant coastal sage scrub within the Noble Tank 2 Area. Biological value of the Project was non-existent (i.e., Cherry Avenue) to low (i.e., remnant sage scrub). The proposed Project will have no significant impact on biological resources given the small development footprint of approximately 1.22-acres for the Noble Tank 2 Area with the majority of this area consisting of Developed/Disturbed/Ruderal areas, in addition to the proposed pipeline being installed within existing development areas.

The Project will potentially impact seven individual coast live oak trees through removal or damage to the dripline[6] root zone; however, no mitigation is required per the County of Riverside's Ordinance No. 559 (as amended through 559.7) (County of Riverside, 1976 (amended 1997)). The purpose of Ordinance No. 559 "is to ensure that the timberlands of the County will be protected and the ecological balance of such timberlands will be preserved by regulating the removal of living native trees on parcels or property greater than one-half (1/2) acre in size and located in the unincorporated area of the County of Riverside above 5,000 feet in elevation" (County of Riverside, 1976 (amended 1997)). The Project is below 5,000 feet in elevation. Ordinance No. 559 further states under Section 4.C. that "Any activities conducted by a public utility, subject to the jurisdiction of the Public Utilities Commission or any other constituted public agency, where, to construct and maintain safe operation of facilities under their jurisdiction, trees are removed, pruned, topped, or braced" are exempt.

Noble Creek has the potential to be adversely affected indirectly by Project activities given its nearby location. The recommendations below will reduce any potential impacts to no significant impact.

[6] The area defined by the outermost circumference of a tree canopy where water drips from and onto the ground.



FIGURE 10
Noble Creek

DATE: September 8, 2018
COORDINATE SYSTEM: NAD 1983 State Plane California VI FIPS 0406 Feet
SOURCE: ESRI Imagery, Geovironment, Searl Biological Services

5.2 Recommendations

SBS recommends the following to reduce the potential for Project-related impacts.

1. In all locations of the Project, construction activities, vehicular traffic (including movement of all equipment), and storage of construction materials shall be restricted to established construction areas indicated by flagging, fencing, and/or signage. No equipment should be staged on the north or west side of Cherry Avenue to reduce potential impacts to Noble Creek.
2. Standard Best Management Practices (BMPs) should be implemented and installed prior to the initiation of construction activities. This includes, but may not be limited to, an Erosion Control Plan (ECP), Stormwater Pollution Prevention Plan (SWPPP), and Water Quality Management Plan (WQMP). BMPs will prevent indirect impacts to Noble Creek.
3. Once the Project area is clearly delineated and the BMPs have been installed, it is recommended that a pre-construction survey be conducted by a qualified biologist within seven days of construction initiation to ensure that staging areas, BMPs, etc. are in the appropriate locations.
4. If project activities occur during the bird nesting season (i.e., February 1 through August 31), a pre-construction nesting bird survey should be performed by a qualified biologist no more than three days prior to any construction activities to avoid any direct or indirect impacts to active nests and thus ensure compliance with the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFGC).
    a. Additional measures may be put in place based on the results of the nesting bird survey at the discretion of the biologist performing the survey. These may include measures such as construction personnel training, the establishment of no disturbance buffers, onsite construction monitoring and/or spot monitoring.
5. During construction, to prevent entrapment of wildlife, all steep-walled trenches, auger holes, open-ended piping, or other excavations should be covered at the end of each day or completely fenced off at night in such a way that wildlife cannot become entrapped. For open trenches only, these may instead have wildlife escape ramps within the trench maintained at intervals of no greater than 100 feet. These ramps shall have a maximum slope not to exceed 2:1.

The Project, following the recommendations above, will have no significant impact on biological resources.

6.0 CEQA BIOLOGICAL RESOURCES CHECKLIST

IV. BIOLOGICAL RESOURCES: Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) 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?	☐	☐	☐	☒

7.0 CERTIFICATION

CERTIFICATION: I hereby certify that the statements furnished above, the associated figures, and the attached appendices present data and information essential for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: October 25, 2019 Signed: Tim Searl

Tim Searl, Owner/Biologist, Searl Biological Services

8.0 REFERENCES

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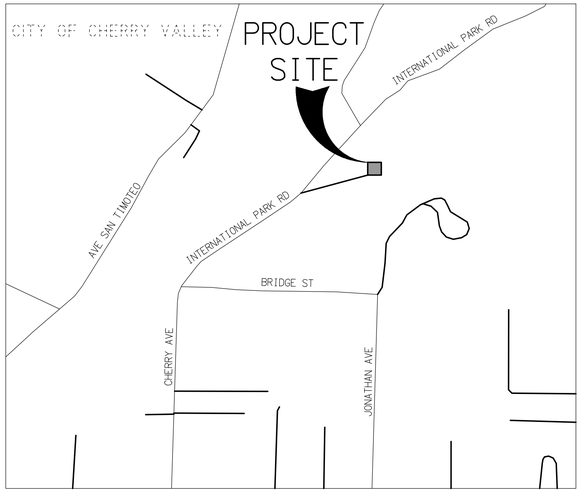
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APPENDIX A

Site Plan

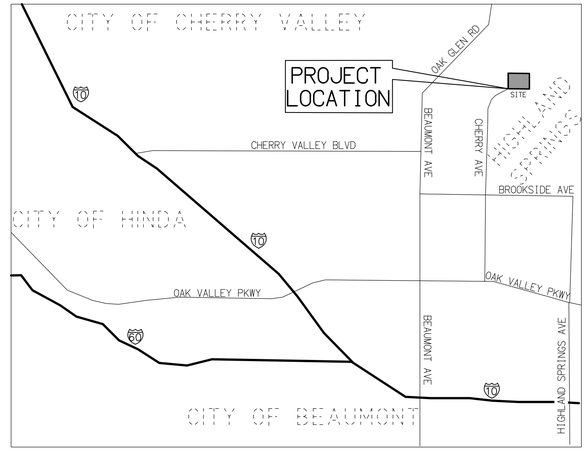
CHERRY VALLEY WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA
PLANS FOR THE CONSTRUCTION OF THE
NOBLE WATER STORAGE TANK II



LOCATION MAP
N.T.S

BOARD OF DIRECTORS

JOHN COVINGTON	PRESIDENT
ANDY RAMIREZ	VICE PRESIDENT
CLAUDEEN DIAZ	SECRETARY
DAVID HOFFMAN	TREASURER
DANIEL SLAWSON	BOARD MEMBER
DANIEL JAGGERS, P.E.	GENERAL MANAGER



VICINTY MAP
N.T.S

ENGINEER'S NOTE TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THESE LOCATIONS ARE APPROXIMATE AND SHALL BE CONFIRMED IN THE FIELD BY A CONTRACTOR SO THAT ANY NECESSARY ADJUSTMENT CAN BE MADE IN ALIGNMENT AND/OR GRADE OF THE PROPOSED IMPROVEMENT. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT THOSE SHOWN ON THIS PLAN. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO THESE LINES OR STRUCTURES.

CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

BENCHMARK

THE BENCHMARK USED IS PER RIVERSIDE COUNTY DATASHEET "DESIGNATION 40-X" STAMPED "40 X R/S"

DESCRIBED BY METRO WATER DISTRICT SO. CALIFORNIA 1992 AT LAKE PERRIS RESERVOIR, AT ENTRANCE GATE TO MWDSC PERRIS PUMPBACK PLANT, ON EASTERLY SIDE OF RAMONA EXPRESSWAY, FOUND 2 1/4 INCH BRASS DISK SET FLUSH, IN TOP OF SOUTHERLY HEADWALL OF CONCRETE DRAIN.

ELEVATION = 1491.80' (NAVD 88)

PROJECT NUMBER 1705500

PROJECT PHASE 1
ISSUE FOR CONSTRUCTION

Cozad & Fox, Inc
CIVIL / STRUCTURAL ENGINEERS
MUNICIPAL CONSULTANTS / PLANNERS
SURVEYORS / GPS
151 SOUTH GIRARD STREET HEMET, CA 92544
TEL. (951) 652-4454 FAX (951) 766-8942
E-MAIL BFOX@KBCOZAD.COM

PREPARED UNDER THE SUPERVISION OF:

DATE:_____

ROBERT L. VESTAL
REGISTERED CIVIL ENGINEER NO. 86258

ENGINEER'S SEAL
REGISTERED PROFESSIONAL ENGINEER
ROBERT L. VESTAL
No. 86258
CIVIL
STATE OF CALIFORNIA

Job No.	
DESIGNED	R.L.V.
DRAWN	D.V.
CHECKED	
APPROVED	R.L.V.
Reg. No.	
Date	

REV	DATE	DESCRIPTION:	BY

Benchmark: SEE SHEET 1

Scale: NONE

BEAUMONT-CHERRY VALLEY WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

District Engineer _____ R.C.E. No. _____ Date _____

NOBLE WATER STORAGE TANK II

TITLE SHEET

Sheet No. 1 OF 4 SHTS

06/07/2018
DATE

ASSUMED LOCATION
EASEMENT IN FAVOR OF PUBLIC OVER ANY EXIST ROADS LYING WITHIN SAID LAND, STREET NAME: NOBLE CANYON ROAD ITEM B2 OF TITLE REPORT
BY LAWYERS TITLE FILE NO: 618650200
DATED: 4/18/18

CHERRY AVE ℄
[R/W]
[R/W]
(E) PAVING
(E) DIRT DWY
INLET
24" RCP
12" RCP
18" RCP
POSSIBLE BASIN
0.28 MG STORAGE
(E) 14" TO BE ABANDONED
12' WIDE GATE
(E) DIRT DRIVEWAY TO BE WIDENED
(E) RV
(E) DIRT DWY
(E) DIRT DWY
(E) 6"
(E) 1MG TANK
70'ø X 36'H
RING = 3036.78
(E) NOBLE REGULATOR
3330 ZONE/3150 ZONE
(E) 12"
3150 ZONE
(E) 12" SD
(E) OUT/IN
IN
(E) NOBLE BOOSTER PUMP TO 3330 ZONE
GRAVEL
24" DIP
6" C&G
6'H SECURITY FENCE
24" ALT VALVE IN VAULT
14" DIP
14" CHECK VALVE IN VAULT
24" DIP
(E) TANK FOUNDATION TO BE REMOVED AND GRADED
30" OVERFLOW & 8" TANK DRAIN
IN
24" CHECK VALVE IN VAULT
24" DIP
OUT
2 MG TANK
100'ø X 36'H
RING=3036.78
APPROXIMATE LOCATION INACTIVE FAULT
(E) BUILDING TO BE DEMOLISHED
℄
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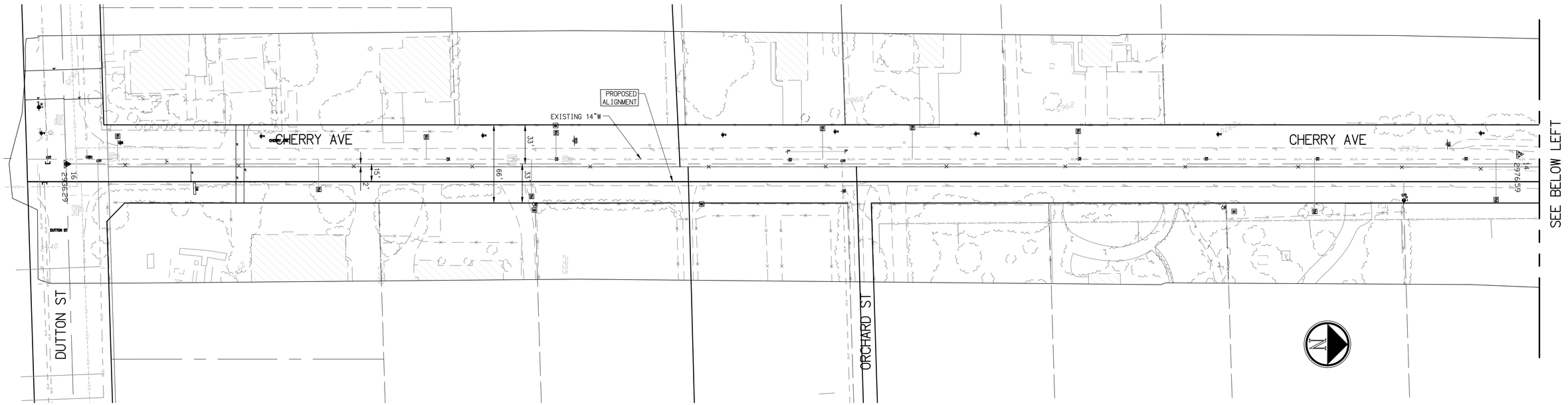
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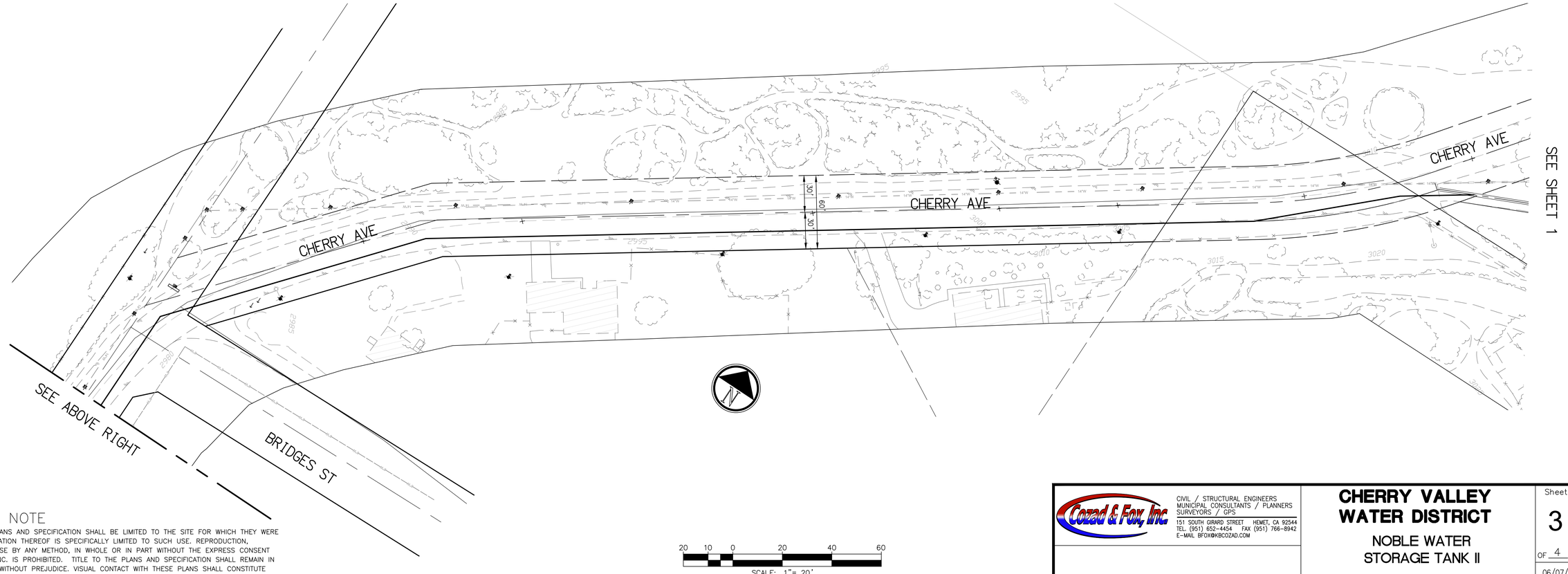
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CHERRY VALLEY WATER DISTRICT

NOBLE WATER STORAGE TANK II

Sheet No. 4 OF 4 SHTS
06/07/2018 DATE





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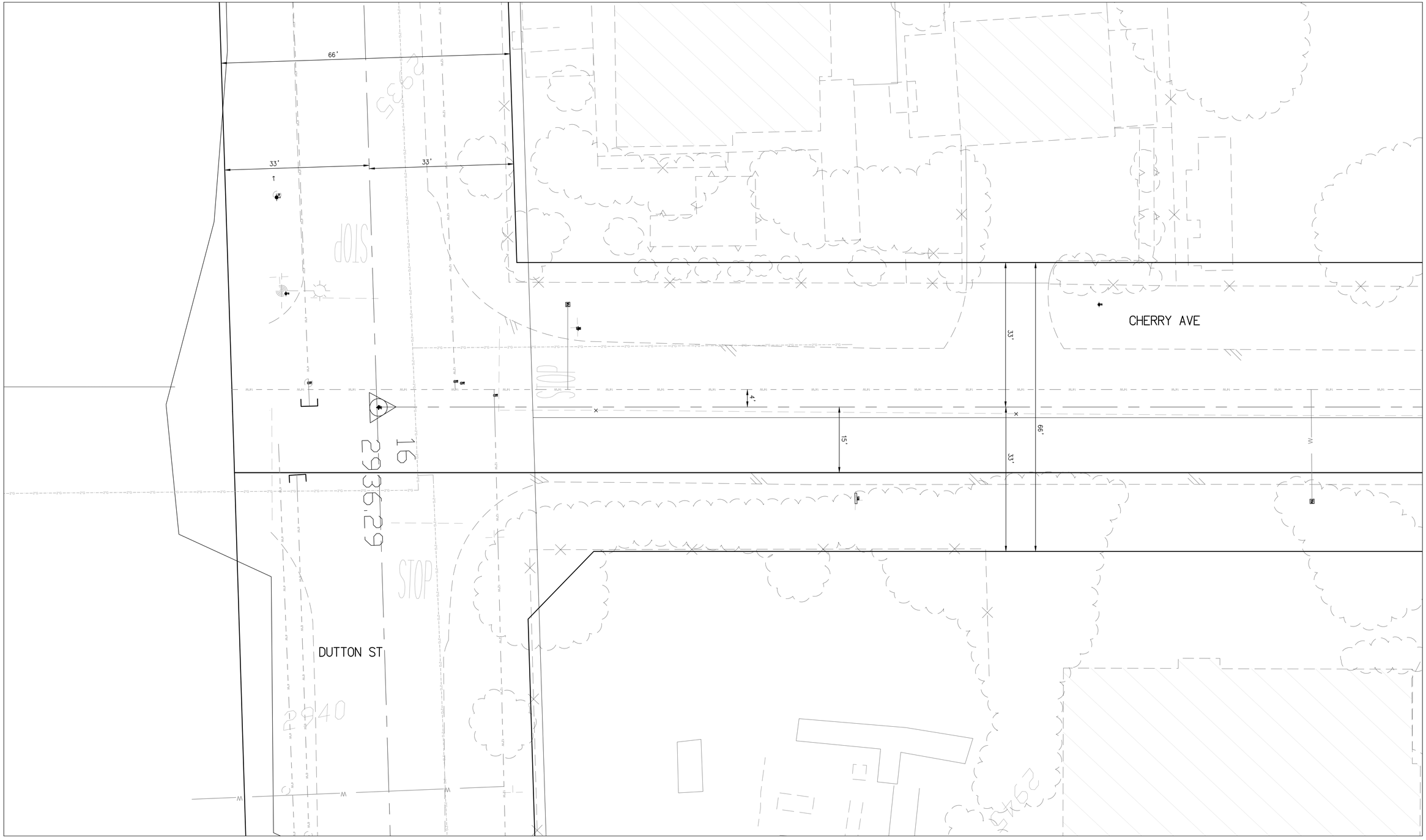
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CHERRY VALLEY WATER DISTRICT

NOBLE WATER STORAGE TANK II

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SCALE: 1"= 10'

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CHERRY VALLEY WATER DISTRICT

NOBLE WATER STORAGE TANK II

Sheet No. 2 OF 4 SHTS

06/07/2018 DATE

APPENDIX B

Vascular Plants Observed

The plants listed below were detected on or near the Project during biological reconnaissance surveys conducted on June 8 and August 3, 2018. Nomenclature follows *The Jepson Online Interchange*. Introduced/naturalized species are indicated with an (I). The list below does not include ornamental landscaped plants.

COMMON NAME	SCIENTIFIC NAME
Amaranth Family	**Amaranthaceae**
tumbleweed (I)	*Amaranthus albus*
Borage Family	**Boraginaceae**
common fiddleneck	*Amsinckia intermedia*
Buckwheat Family	**Polygonaceae**
California buckwheat	*Eriogonum fasciculatum*
Slender woolly buckwheat	*Eriogonum gracile*
Goosefoot Family	**Chenopodiaceae**
tumbleweed (I)	*Salsola tragus*
Gourd Family	**Cucurbitaceae**
Buffalo gourd	*Cucurbita foetidissima*
Grass Family	**Poaceae**
cheat grass (I)	*Bromus tectorum*
red brome (I)	*Bromus madritensis* subsp. *rubens*
ripgut grass (I)	*Bromus diandrus*
slender wild oat (I)	*Avena barbata*
Legume Family	**Fabaceae**
deerweed	*Acmispon glaber*
Muskroot Family	**Adoxaceae**
blue elderberry	*Sambucus nigra* subsp. *caerulea*
Mustard Family	**Brassicaceae**
shortpod mustard (I)	*Hirschfeldia incana*
Myrtle Family	**Myrtaceae**
gum tree (I)	*Eucalyptus* sp.
Oak Family	**Fagaceae**
coast live oak	*Quercus agrifolia*
Quassia Family	**Simaroubaceae**
tree-of-heaven (I)	*Ailanthus altissima*
Rose Family	**Rosaceae**
chamise	*Adenostoma fasciculatum*
Spurge Family	**Euphorbiaceae**
California croton	*Croton californicus*
doveweed	*Croton setiger*
rattlesnake sandmat	*Euphorbia albomarginata*
Sunflower Family	**Asteraceae**
Bioletti's cudweed	*Pseudognaphalium biolettii*
common sandaster	*Corethrogyne filaginifolia*
horseweed	*Erigeron canadensis*
mulefat	*Baccharis salicifolia*
prickly lettuce (I)	*Lactuca serriola*
Tarragon	*Artemisia dracunculus*
telegraph weed	*Heterotheca grandiflora*
western ragweed	*Ambrosia psilostachya*

COMMON NAME	SCIENTIFIC NAME
wire lettuce	*Stephanomeria exigua*
Sycamore Family	**Platanaceae**
western sycamore	*Platanus racemosa*
Willow Family	**Salicaceae**
Fremont cottonwood	*Populus fremontii subsp. fremontii*
red willow	*Salix laevigata*

APPENDIX C

Wildlife Observed

Birds

The bird species listed below were detected on or near the Project during biological reconnaissance surveys conducted on June 8 and August 3, 2018. The list below is presented in alphabetic order. Nomenclature for the Family (i.e., Corvidae), Common Name, and Scientific Name follow the American Ornithologists' Union (AOU) *Checklist of North and Middle American Birds*.

COMMON NAME	SCIENTIFIC NAME
Chickadees and Titmice	**Paridae**
Oak Titmouse	*Baeolophus inornatus*
Crows and Jays	**Corvidae**
California Scrub-Jay	*Aphelocoma californica*
Common Raven	*Corvus corax*
Finches and Allies	**Fringillidae**
House Finch	*Haemorhous mexicanus*
Lesser Goldfinch	*Spinus psaltria*
Hawks, Kites, Eagles, and Allies	**Accipitridae**
Red-tailed Hawk	*Buteo jamaicensis*
Hummingbirds	**Trochilidae**
Anna's Hummingbird	*Calypte anna*
Long-tailed Tits and Bushtits	**Aegithalidae**
Bushtit	*Psaltriparus minimus*
New World Quail	**Odontophoridae**
California Quail	*Callipepla californica*
New World Sparrows	**Passerellidae**
California Towhee	*Melozone crissalis*
Nuthatches	**Sittidae**
White-breasted Nuthatch	*Sitta carolinensis*
Pigeons and Doves	**Columbidae**
Mourning Dove	*Zenaida macroura*
Silky-Flycatchers	**Ptiliogonatidae**
Phainopepla	*Phainopepla nitens*
Sylviid Warblers	**Sylviidae**
Wrentit	*Chamaea fasciata*
Tyrant Flycatchers	**Tyrannidae**
Black Phoebe	*Sayornis nigricans*
Cassin's Kingbird	*Tyrannus vociferans*
Woodpeckers and Allies	**Picidae**
Acorn Woodpecker	*Melanerpes formicivorus*
Nuttall's Woodpecker	*Picoides nuttallii*

Mammals

The mammals listed below were observed on or near the Project during biological reconnaissance surveys conducted on June 8 and August 3, 2018 through sign and/or physical sightings. The list below is presented in alphabetic order. Nomenclature for the Family (i.e., Geomyidae), Common Name, and Scientific Name follow *Wilson & Reeder's Mammal Species of the World*.

COMMON NAME	SCIENTIFIC NAME
Hares and Rabbits	**Leporidae**
desert cottontail	*Sylvilagus audubonii*
Pocket Gophers	**Geomyidae**
Botta's pocket gopher	*Thomomys bottae*
Squirrels	**Sciuridae**
California ground squirrel	*Spermophilus beecheyi*

APPENDIX D

Site Photographs



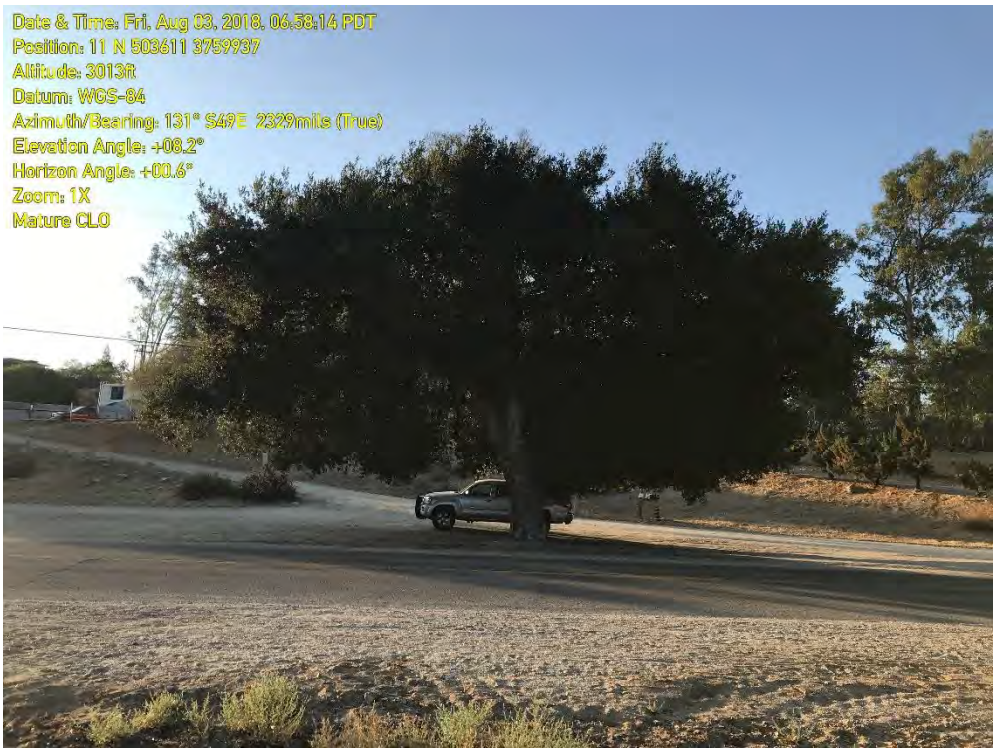
PHOTOGRAPH 1 – The existing concrete that will be demolished for Noble Tank No.2.



PHOTOGRAPH 2 – Existing Noble Tank No. 1 and a portion of the future Noble Tank No.2 area.



PHOTOGRAPH 3 – An emergent coast live oak near existing Noble Tank No.1.



PHOTOGRAPH 4 – A mature coast live oak near the Project area.



PHOTOGRAPH 5 – A view of the same general area as Photograph 4 from different angle.



PHOTOGRAPH 6 – A mature coast live oak near the proposed pipeline alignment.



PHOTOGRAPH 7 – The general area of a portion of the proposed pipeline alignment.



PHOTOGRAPH 8 – An immature coast live oak near the proposed pipeline alignment.



PHOTOGRAPH 9 – The proposed area for the 0.28 MG Storage Basin if constructed. A mature coast live oak was present within this area.



PHOTOGRAPH 10 – A coast live oak/western sycamore woodland adjacent to the Project area.

A PHASE I CULTURAL RESOURCES INVENTORY FOR THE NOBLE WATER STORAGE TANK NO. 2 AND TRANSMISSION PIPELINE PROJECT CHERRY VALLEY, RIVERSIDE COUNTY, CALIFORNIA

by: Jay K. Sander, M.A.
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San Jacinto, California 92583

for: Beaumont-Cherry Valley Water District
560 Magnolia Avenue
Beaumont, CA 92223

September 13, 2018

Keywords: USGS 7.5' *Beaumont* Quadrangle, Riverside County, No cultural resources

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MANAGEMENT SUMMARY

Geovironment Consulting (Geovironment) performed a Phase I cultural resources study in support of the proposed Cherry Valley project. The approximately 3,970-acre project follows the west side of Cherry Avenue/International Park Road, bounded to the south by Dutton Street and to the north by Avenue Altura Buena. (Figures 1 and 2). The project area is in the town of Cherry Valley, Riverside County, California. It is bounded by Noble Creek to the west municipal and residential development to the east. The project area lies within the U.S. Geological Survey (USGS) 7.5-minute *Beaumont, California* topographic quadrangle.

Results of the review of the survey reports and site records provided by the Eastern Archaeological Information Center indicate that a total of 26 previous cultural resource inventories or other archaeological investigations have been conducted within a one-mile radius of the project area including three that included portions of the current project area (Table 1). Seven additional reports provide overviews of the project vicinity. The records search also revealed that there are eight previously recorded cultural resources within a one-mile radius of the project area. None of these are within or adjacent to the project area. Therefore, no eligible or listed cultural resources will be impacted as a result of the proposed project.

INTRODUCTION

This report provides the results of the cultural resources inventory for the proposed Beaumont-Cherry Valley Water District Noble Water Storage Tank No. 2 and Transmission Pipeline Project. The approximately 3,970-acre project follows the west side of Cherry Avenue/International Park Road, bounded to the south by Dutton Street and to the north by Avenue Altura Buena in the city of Cherry Valley (Figure 2). State law, as set forth in the California Environmental Quality Act (CEQA) §21083.2(a) and §15064.5, requires that a cultural resources evaluation of the project area be completed before construction work can proceed.

In compliance with CEQA, Geovironment Consulting (Geovironment) was retained to perform a records/literature review of cultural resources known to exist on or near the project area, as well as a desktop study to identify any previously unrecorded cultural resources that may exist there. The cultural resources inventory presented herein consists of the results of the cultural resources record search/literature review and the results of the desktop study of the project area.

LOCATION AND ENVIRONMENTAL SETTING

The project area is within the foothills of the San Bernardino mountains, on the edge of the Noble Creek floodplain and alluvial fan. It is bounded by the San Bernardino Mountains to the north and the San Gorgonio Pass to the south. The property is between approximately 2,920 feet and 3,020 feet above mean sea level, sloping down towards the southwest. Remaining native vegetation is comprised of coastal sage scrub. Soils in the project area are gravely loamy sands derived from granitic parent material.

CULTURAL BACKGROUND

Prehistory

It is generally believed that human occupation of southern California dates back to at least 10,000 years before present (BP). Four cultural periods of prehistoric occupation of California during the Holocene Epoch (10,000 years BP to present) are discussed below: the Early Holocene Period, the Early Horizon Period, the Middle Horizon Period, and the Late Horizon Period. During the Early Holocene Period (10,000 to 8,000 years BP), hunters/gatherers utilized lucustrine and marshland settings for the varied and abundant resources found there. Milling-related artifacts are lacking from archaeological sites dating to this period, but the atlatl and dart are common. Hunting of large and small game occurred, as well as fishing. A few scattered permanent settlements were established near large water sources, but a nomadic lifestyle was more common (Erlandson 1994; Moratto 1984).



Geovironment CONSULTING

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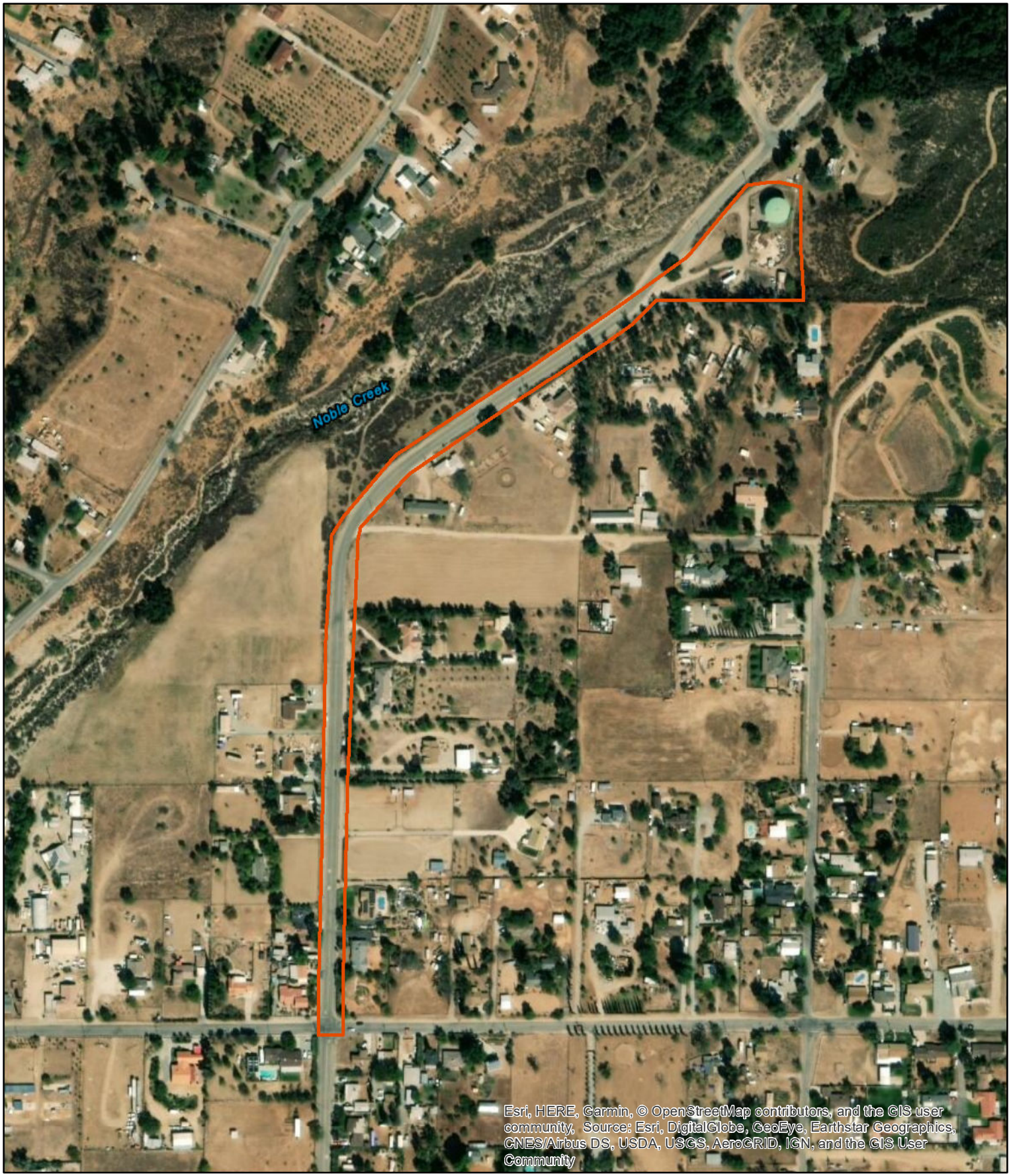
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EXHIBIT **1**

PROJECT VICINITY MAP

BEAUMONT-CHERRY VALLEY WATER DISTRICT
NOBLE TANK PROJECT

Project Site 1 mi radius



Geovironment CONSULTING

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EXHIBIT **2**

PROJECT SITE MAP

BEAUMONT-CHERRY VALLEY WATER DISTRICT
NOBLE TANK PROJECT

Project Site

Milling-related artifacts first appear in archaeological sites dating to the Early Horizon Period (8,000 to 4,000 years BP). Hunting and gathering continued during this period, but with greater reliance on vegetal foods. Mussels and oysters were a staple among coastal groups. This gave way to greater consumption of shellfish in the Middle Horizon Period (4,000 to 2,000 years BP). Use of bone artifacts appears to have increased during this period, and baked-earth steaming ovens were developed. Occupation of permanent or semi-permanent villages occurred in this period, as did reoccupation of seasonal sites. During the Late Horizon Period (2,000 years BP to the time of European Contact (around A.D. 1769), population densities were high and settlement in permanent villages increased. Regional subcultures also developed, each with its own geographical territory and language or dialect. These groups, bound by shared cultural traits, maintained a high degree of interaction, including trading extensively with one another (Erlandson 1994; Moratto 1984).

Ethnohistory

The project area is located in the region known to have been occupied by the Cahuilla Indians. Cahuilla territory was bounded on the north by the San Bernardino Mountains, on the east by the Orocopia Mountains, on the west by the Santa Ana River, the San Jacinto Plain and the eastern slope of the Palomar Mountains, and on the south by Borrego Springs and the Chocolate Mountains (Bean 1978).

The diversity of the territory provided the Cahuilla with a variety of foods. It has been estimated that the Cahuilla exploited more than 500 native and non-native plants (Bean and Saubel 1972). Acorns, mesquite, screw beans, piñon nuts, and various types of cacti were used. A variety of seeds, wild fruits and berries, tubers, roots, and greens were also a part of the Cahuilla diet. A marginal agricultural existence provided corn, beans, squashes, and melons. Rabbits and small animals were also hunted to supplement the diet. During high stands of Ancient Lake Cahuilla, fish, migratory birds, and marshland vegetation were also taken for sustenance and utilitarian purposes (Bean 1978).

Structures within permanent villages ranged from small brush shelters to dome-shaped or rectangular dwellings. Villages were situated near water sources, in the canyons near springs, or on alluvial fans at man-made walk-in wells (Bean 1972). Mortuary practices entailed cremation of the dead. Upon a person's death, the body was bound or put inside a net and then taken to a place where the body would be cremated. Secondary interments also occurred. A mourning ceremony took place about a year after a person's death. During this ceremony, an image of the deceased was burned along with other goods (Lando and Modesto 1977; Strong 1929).

Precontact Cahuilla population has been estimated as low as 2,500 to as high as 10,000. At the time of first contact with Europeans, around 1774, the Cahuilla numbered approximately 6,000. Although they were the first to come into contact with the Cahuilla, the Spanish had little to do with those of the desert region. Some of the Cahuilla who lived in the plains and valleys west of the desert and mountains, however, were missionized through the asistencia located near present day San Bernardino. Cahuilla political, economic, and religious autonomy was maintained until 1877 when the United States government established Indian reservations in the region. Protestant missionaries came into the area to convert and civilize the Native American population. During this era, traditional cultural practices, such as cremation of the dead, were prohibited. Today, the Cahuilla reside on eight separate reservations in southern California, located from Banning in the north to Warner Springs in the south and from Hemet in the west to Thermal in the east (Bean 1978).

History

The first significant European settlement of California began during the Spanish Period (1769 to 1821) when 21 missions and 4 presidios were established between San Diego and Sonoma. Although located primarily along the coast, the missions dominated economic and political life over the majority of the California region during this period. The purpose of the missions was primarily Indian control, along with economic support to the presidios, forced assimilation of the Indians to Hispanic society, and conversion of the native population to Spanish Catholicism (Castillo 1978; Cleland 1941).

The Mexican Period (1821 to 1848) began with the success of the Mexican Revolution in 1821, but changes to the mission system were slow to follow. When secularization of the missions occurred in the 1830s, the vast land holdings of the missions in California were divided into large land grants called ranchos. The Mexican government granted ranchos throughout California to Spanish and Hispanic soldiers and settlers (Castillo 1978).

In 1848, the Treaty of Guadalupe Hidalgo ended the Mexican-American War and marked the beginning of the American Period (1848 to present). The discovery of gold the same year initiated the 1849 California Gold Rush, bringing thousands of miners and settlers to California, most of who settled in the north. For those settlers who chose to come to southern California, much of their economic prosperity was fueled by cattle ranching rather than by gold. This prosperity, however, came to a halt in the 1860s as a result of severe floods and droughts, which put many ranchos into bankruptcy (Castillo 1978; Cleland 1941).

The Cherry Valley Land and Water Company began selling property in the San Bernardino Mountain foothills in 1885. (Gunther 1984). One of the directors of the company was Mr. George F. Dutton who leant his name

to the road bounding the current project to the south. As the name implies, the foothills above 3,000 feet in elevation were considered suitable for cherry orchards and other types of fruit trees which require a dormant season.

METHODOLOGY

Background Record Search Methods

A record search/literature review was conducted on August 16, 2018 at the Easter Information Center, located at the University of California, Riverside. The purpose of this review was to access any existing cultural resources survey reports, archaeological site records, and historic maps to evaluate whether previously documented prehistoric or historic archaeological sites, architectural resources, cultural landscapes, or ethnic resources exist within or near the project area. The record search/literature review was also conducted to evaluate whether any historic properties listed on or determined eligible for listing on the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) exist within the project area.

Desktop Study Methods

While a rigorous research design is not a critical component to a Phase I archaeological survey, a basic understanding of the history of a property can provide insight into the types of historic or archaeological remains that may exist. Geoenvironment used the results of the record search to develop a rudimentary research design to guide the survey. In addition, experience with conducting similar surveys in the area suggested that it was highly unlikely that previously unrecorded historic refuse would be located on the property which could be of sufficient age to merit documentation. Geovironment archaeologist, Jay Sander, conducted a desktop study of the project area on August 23, 2018.

RESULTS

Records Search Results

Results of the review of the survey reports and site records provided by the Eastern Information Center indicate that a total of 26 previous cultural resource inventories or other archaeological investigations have been conducted within a one-mile radius of the project area including three that included portions of the current project area (Table 1). Seven additional reports provide overviews of the project vicinity. The records search also revealed that there are eight previously recorded cultural resources within a one-mile radius of the project area. None of these are within or adjacent to the project area. Therefore, no eligible or listed cultural resources will be impacted as a result of the proposed project.

Table 1. Previous Investigations within One-Mile of the Project Area

Report No.	Author	Date	Cultural Resources Found
RI-00039	Mary A. Brown and Martha J. Solig	1972	No
RI-00040	David M. Van Horn	1982	No
RI-00041	R.E Taylor and Herrick E. Hanks	1972	No
RI-00161	Roberta S. Greenwood	1975	No
RI-00301	James Baldwin	1978	No
RI-00341	M.A. Brown	1978	No
RI-00988	James P. Barker and Sarah H. Schlanger	1974	Yes
RI-00989	Leslie E. Wildesen	1974	No
RI-00990	James P. Baker	1974	Yes
RI-01955	HELLER, ROD, TIM TETHEROW, and C. WHITE	1977	No
RI-02717	KELLER, JEAN A.	1990	No
RI-02860	SWANSON, MARK T.	1990	No
RI-02891	Joanne Mack	1990	No
RI-03521	Jean A. Keller	1992	No
RI-03852	WHITNEY-DESAUTELS, NANCY	1993	No
RI-04544	Robert S. White and Laura S. White	2002	No
RI-04762	BARKER, LEO R. and ANN E. HUSTON, EDITORS	1990	No
RI-04815	YORK, ANDREW and JANE E. WOOLEY	1987	Yes
RI-05017	Jeanette A. McKenna	2004	No
RI-05018	Jeanette A. McKenna	2004	No
RI-05660	ALEXANDROWICZ, JOHN STEPHEN	2004	Yes
RI-06192	Bai Tang, Michael Hogan, Josh Smallwood, and Daniel Ballester	2004	No
RI-07054	Hogan, Michael and Bai Tang	2007	No
RI-07288	Mariam Dahdul, Daniel Ballester, and Laura H. Shaker	2007	Yes
RI-07712	Ahmet, Koral	2008	No
RI-07869	Jordan, Stacey C. and Michael M. DeGiovine	2008	No
RI-08053	Michael Bradman Associates	2008	No
RI-08313	Tiffany A. Schmid and Janis K. Offermann	2010	No
RI-08337	James J. Schmidt	2009	No
RI-08449	Bai "Tom" Tang, Michael Hogan, Josh Smallwood, and Terri Jacquemain	2004	No
RI-08461	Kurt Heidelberg	2009	No
RI-09298	David Brunzell	2015	No

Report No.	Author	Date	Cultural Resources Found
RI-09592	David Brunzell	2015	No

Desktop Study Results

Geovironment Consulting archaeologist Jay Sander studied photographs of the project area which revealed that the entire project area has been mechanically graded and disked in the past as well as developed for road and residential construction. This precludes the possibility of finding any intact cultural resources within the project area.

CONCLUSIONS AND RECOMMENDATIONS

Results of the review of the survey reports and site records provided by the Eastern Information Center indicate that a total of 26 previous cultural resource inventories or other archaeological investigations have been conducted within a one-mile radius of the project area including three that included portions of the current project area (Table 1). Seven additional reports provide overviews of the project vicinity. The records search also revealed that there are eight previously recorded cultural resources within a one-mile radius of the project area. None of these are within or adjacent to the project area. Therefore, no eligible or listed cultural resources will be impacted as a result of the proposed project. The entire project area has disturbed through grading and disking; thus, any construction activities would not constitute a significant impact to any historical resources under CEQA; therefore, no further cultural resources work is recommended.

However, any grading permit or contract should contain a clause regarding the appropriate actions to take in the event that any subsurface archaeological deposits are unearthed during ground-disturbing construction activities. In that event, all activities must be suspended in the vicinity of the find until the deposit(s) are recorded and evaluated by a qualified archaeologist. If human remains of any kind are found, all activities must cease immediately and the Riverside County Coroner, and a qualified archaeologist must be notified. If the coroner determines the remains to be of Native American origin, he or she will notify the Native American Heritage Commission (NAHC). The NAHC will then identify the most likely descendants to be consulted regarding treatment and/or repatriation of the remains.

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Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

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

GEOTECHNICAL INVESTIGATION REPORT

NOBLE WATER STORAGE TANK NO. 2 AND TRANSMISSION PIPELINE
COMMUNITY OF CHERRY VALLEY, RIVERSIDE COUNTY, CALIFORNIA

CONVERSE PROJECT NO. 17-81-258-01





Prepared For:

COZAD & FOX, INC.
151 South Girard Street
Hemet, CA 92544-4662

Presented By:

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

September 6, 2019

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

September 6, 2019

Mr. Brian Fox, PE, PLS
Principal
Cozad & Fox, Inc.
151 South Girard Street
Hemet, CA 92544-4662

Subject: **GEOTECHNICAL INVESTIGATION REPORT**
Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
Converse Project No. 17-81-258-01

Dear Mr. Fox:

Converse Consultants (Converse) is pleased to submit this geotechnical investigation report to assist with the design and construction of the Noble Water Storage Tank No. 2 located approximately 250 feet south of the intersection of International Park Road and Avenue Altura Bella and transmission pipeline located along International Park Road and Cherry Avenue from the Tank No. 2 to Dutton Street, in the Community of Cherry Valley, Riverside County, California. This report was prepared in accordance with our proposal dated August 31, 2017 and your Acceptance of Agreement and Authorized to Proceed dated February 1, 2018.

Converse prepared a fault review letter for the Noble Water Storage Tank No. 2 and transmission pipeline dated April 10, 2018. All the information from the fault letter has been incorporated in this report.

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

We appreciate the opportunity to be of service to Cozard and Fox, Inc. Should you have any questions, please do not hesitate to contact us at 909-796-0544.

CONVERSE CONSULTANTS

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

Dist.: 4/Addressee
HSQ/SM/JB/ZA/kvg

PROFESSIONAL CERTIFICATION

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

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







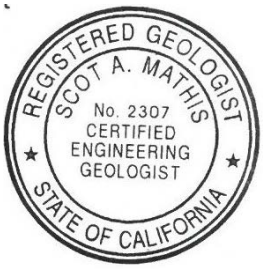
Zahangir Alam, PhD, EIT
Senior Staff Engineer

Jay Burnham, PG
Project Geologist









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

Scot Mathis, PG, CEG
Senior Geologist

EXECUTIVE SUMMARY

The following is a summary of our geotechnical investigation, conclusions and recommendations, as presented in the body of this report. Please refer to the appropriate sections of the report for complete conclusions and recommendations. In the event of a conflict between this summary and the report, or an omission in the summary, the report shall prevail.

- The existing Noble Tank is located on Cherry Avenue (APN No. 401-210-010) 150 feet south of the intersection of Avenue Altura Bella and International Park Road in the Community of Cherry Valley, California. The proposed improvements will include a 2MG steel storage tank at a high-water level of 3,040 feet with associated onsite pipelines and approximately 2,800 linear feet of 20-inch diameter ductile iron pipe transmission main. The proposed transmission pipeline will originate from the proposed Noble Tank No. 2 and traverse southwest and then south along Cherry Avenue to tie into the pipeline at the intersection on Dutton Street. We understand the pipe invert depth will be approximately 6 to 7 feet below existing ground surface (bgs). and it will be installed using the open cut-and-cover technique.

- The tank site currently contains a remnant concrete ring foundation from a former tank. The existing foundation is approximately 100 feet in diameter and protrudes up to 5 feet above the ground surface. The foundation space is currently used for miscellaneous equipment storage. The existing tank is located north of the proposed Tank No. 2 location. We anticipate that the water tank will be founded on a continuous spread footing (ring foundation) and the roof supported on isolated spread footings.

- Our scope of work included project setup, subsurface exploration, laboratory testing, infiltration testing, engineering analysis, and preparation of this report.

- Three exploratory borings (BH-01 through BH-03) at the tank site were drilled on April 26, 2018. The borings were drilled to the planned maximum depths between 21.5 and 51.0 feet bgs, except for boring BH-02 which was terminated at 45.5 feet bgs due to refusal on suspected bedrock.

- Six exploratory borings (BH-04 through BH-09) along the transmission pipeline were drilled on April 26 and June 20, 2018. The borings were drilled to the planned maximum depths between 15.3 and 21.5 feet bgs.

- The subsurface soil at the tank site consisted primarily of alluvial soils consisting of gravelly sand with little silt. Gravel up to 2 inches in largest dimension was observed in all borings. Based on hammer blow counts, the upper 10 feet soils are

medium dense to dense. Relative compaction of the upper 10 feet soils varies from 78 (sample disturbed due to presence of gravel) to 92 percent.

- The subsurface soil along the pipeline alignment consisted primarily of alluvial soils consisting of gravelly sand with little silt. Some gravel up to 2 inches in largest dimension was observed in all borings. Based on hammer blow counts, the upper 10 feet soils are medium dense to dense. Relative compaction of the upper 10 feet soils varies from 77 (sample disturbed due to presence of gravel) to 92 percent.

- Groundwater was not encountered in our exploratory borings to the maximum explored depth of 51.0 feet bgs. Based on available data, groundwater is deeper than 50 feet bgs. Groundwater is not expected to be encountered during the construction of this project.

- Riverside County fault zone maps do not indicate any active faults or fault zones projecting toward or extending across the tank site. The California Geological Survey Earthquake Fault Zone Map for the Beaumont Quadrangle does not indicate any active faults or fault zones projecting toward or extending across the tank site.

- Riverside County fault zone maps indicate an active fault zone crosses the pipeline alignment from approximately 280 feet south of Bridges Street to the termination of the proposed new alignment at Dutton Street. The county-designated fault zone is associated with the active San Andreas Fault Zone. This fault zone is not present on the California Geological Survey Earthquake Fault Zone Map for the Beaumont Quadrangle.

- The potential for earthquake-induced liquefaction, lateral spreading, landsliding, or flooding at the site is considered low.

- The expansion indices (EI) of the samples tested at the tank site were 0, corresponding to very low expansion potential.

- The measured sand equivalent at the tank site was 46 and along the pipeline alignment ranged from 30 to 63.

- The collapse potential of the sample tested at the tank site was 1.7 percent, indicating slight collapse potential. The collapse potential of the samples tested along pipeline was 2.4 percent, indicating moderate collapse potential.

- The sulfate and chloride contents of soil samples tested at the tank site and along pipeline alignment correspond to American Concrete Institute (ACI) exposure category S0 and C1, respectively. Design recommendations for these categories are provided in the text of this report.

- The measured values of the minimum electrical resistivities of the samples at the tank site when saturated were 8,000 and 12,000 ohm-cm. This indicates that the soils tested are moderately corrosive to mildly corrosive to ferrous metals in contact with the soils. The measured values of the minimum electrical resistivities of the samples along the pipeline alignment when saturated were 4,836 and 22,000 ohm-cm. This indicates that the soils tested are moderately corrosive to mildly corrosive to ferrous metals in contact with the soils. A corrosion engineer should be consulted for corrosion mitigation measures for ferrous metals in contact with the soil, if necessary.

- Prior to the start of construction, the existing tank foundation should be demolished. All existing underground utilities and appurtenances, if present, should be located at the project site. All debris, surface vegetation, deleterious material, surficial soils containing roots and perishable materials and demolished materials should be stripped and removed from the site.

- Based on our subsurface exploration, we anticipate that the site soil will be excavatable with conventional heavy-duty earthworking and trenching equipment. Excavation will likely be difficult due to the presence of gravel and possible cobbles.

- Excavated onsite earth materials cleared of deleterious matter can be moisture conditioned and re-used as compacted fill.

- The footings and slab should be placed on at least 24 and 18 inches of compacted fill, respectively. The overexcavation below the footings and slab should be uniform. The overexcavation should extend to at least 2 feet beyond the footprint of the footings and slab.

- Fill placed within 2 feet of the tank footprint should be compacted to at least 95 percent of the laboratory maximum dry density as determined by ASTM Standard D1557 test method. Fill placed more than 2 feet outside of the tank footprint should be compacted to at least 90 percent of the laboratory maximum dry density.

- All areas to receive asphalt or concrete pavement should be overexcavated to a depth of 12 inches below subgrade. The overexcavation should extend at least one foot beyond the edge of pavement. At least the upper 12 inches of fill beneath pavement intended to support vehicle loads should be compacted to at least 95 percent of the laboratory maximum dry density.

- Footings should be at least 18 inches in width and embedded to at least 18 inches below the lowest adjacent grade. The footing dimensions and reinforcement should be based on structural design. Continuous and isolated footings can be designed based on an allowable net bearing capacity of 2,000 psf.

- The total settlement of shallow footings from static structural loads and short-term settlement of properly compacted fill is anticipated to be 1 inch or less. The differential settlement resulting from static loads is anticipated to be 0.5 inches or less over a horizontal distance of 40 feet.

- The tank site has the potential for up to 3.9 inches of dry seismic settlement with negligible liquefaction induced settlement during a large earthquake. The estimated dynamic differential settlement is up to 0.6 inches over a horizontal distance of 40 feet. The static and dynamic settlement estimates should not be combined for design purposes.

- Lateral earth pressures and pipe design parameters are presented in the text of this report.

- Two double-ring infiltrometer tests (DR-01 and DR-02) were performed on August 21 and 27, 2019 to evaluate water quality infiltration of the surface soils. The recommended design infiltration rate for the site is 0.85 inches/hour and 1.28 inches/hour for a factor of safety of 3 and 2, respectively. Selection of factor of safety should be based on design engineer.

- Recommendations for temporary sloped excavations and temporary shoring are provided in the text of this report.

Based on our investigation, it is our professional opinion that the tank site and pipeline alignment are suitable for construction provided the findings and conclusions presented in this geotechnical investigation report are considered in the planning, design and construction of the project.

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APPENDICES

Appendix A.....*Field Exploration*
Appendix B.....*Laboratory Testing Program*
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Appendix D..... *Utility Trench Backfill*
Appendix E.....*Double Ring Infiltrometer Testing*

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed for the proposed Noble Water Storage Tank No. 2 located approximately 250 feet south of the intersection of International Park Road and Avenue Altura Bella and transmission pipeline located along International Park Road and Cherry Avenue from the Tank No. 2 to Dutton Street, in the Community of Cherry Valley, Riverside County, California. The tank site and pipeline alignment are shown in Figure No. 1, *Approximate Alignment and Site Locations Map*.

The purposes of this investigation were to determine the nature and engineering properties of the subsurface soils, and to provide design and construction recommendations for the proposed water tank and pipeline.

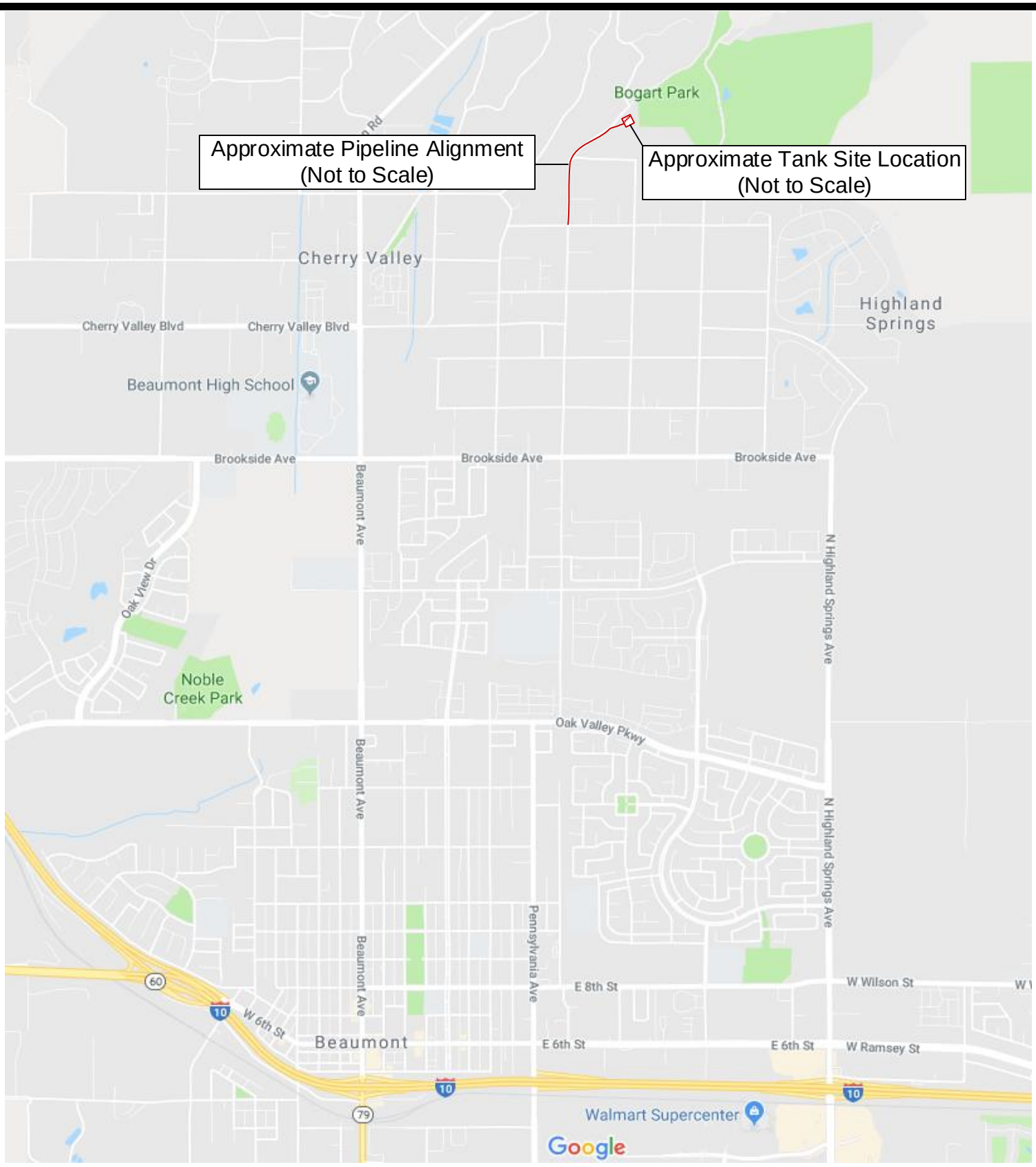
This report is prepared for the project described herein and is intended for use solely by Cozard and Fox, Inc. and their authorized agents for design purposes. It should not be used as a bidding document but may be made available to the potential contractors for information on factual data only. For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

2.0 PROJECT BACKGROUND/DESCRIPTION

The existing Noble Tank is located on Cherry Avenue (APN No. 401-210-010) just 150 feet south of the intersection of Avenue Altura Bella and International Park Road in the Community of Cherry Valley, California.

The existing Noble Zone (3040), supplied by the District's Base Pressure Zone (2750), has a need for increased storage capacity to satisfy system demands created by near term development activity. The existing zone is fed by the existing Noble Tank as well as the existing Highland Springs Tank which each has a storage volume of 1 Million Gallon (MG). According to the Water Facilities Master Plan, the proposed improvements will include the following.

- A 2MG Steel Storage Tank at a high-water level of 3,040 feet with associated pipeline.
- Approximately 2,800 linear feet of 20-inch diameter ductile iron pipe transmission main.
- Abandonment and demolition of the existing original Noble Tank concrete pad located southerly of the existing Noble Tank No. 1 to make space for Noble Tank No. 2.



Approximate Alignment and Site Location Map

Project: Noble Water Storage Tank No. 2 and Transmission Pipeline
Location: Cherry Valley Community, Riverside County, California
For: Cozad and Fox, Inc.

Project No.
17-81-258-01

Converse Consultants

Figure No.
1

The transmission pipeline will originate from the proposed Noble Tank No. 2 and traverse southwest and then south along Cherry Avenue to tie into the pipeline at the intersection on Dutton Street.

We understand the pipe invert depth will be approximately 6 to 7 feet below existing ground surface (bgs) and it will be installed using the open cut-and-cover technique. We anticipate that the water tank will be founded on a continuous spread footing (ring foundation) and the roof supported on columns resting on isolated spread footings.

3.0 SITE DESCRIPTIONS

Site descriptions for tank site and pipeline are presented below.

Tank Site

The tank site currently contains a remnant concrete ring foundation from a former tank. The existing foundation is approximately 100-foot in diameter and protrudes up to 5 feet above the ground surface. The foundation space is currently used for miscellaneous equipment storage. The existing tank is located north of the proposed Tank No. 2. Photographs 1 and 2 depict the present tank site conditions.



Photograph No. 1: Remnant ring foundation at proposed water Tank No. 2.



Photograph No. 2: Existing tank located north of the proposed Tank No. 2.

Pipeline

The pipeline alignment will begin at the new tank location, traverse approximately 1,400 feet southwest along International Park Road, and continue approximately 1,400 feet south along Cherry Avenue. The roadways along the pipeline alignment are one-lane each direction with sparse trees and overhead utilities. Portions of the roadway along the alignment have dirt shoulders. Light traffic was observed throughout the day. Typical roadway conditions along the alignment are shown in the following photograph.



Photograph No. 3: Present road conditions along Cherry Avenue.

4.0 SCOPE OF WORK

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

4.1 Document Review

We reviewed geologic maps, aerial photographs, groundwater data, and other information pertaining to the project area to assist in the evaluation of geologic hazards that may be present.

4.2 Project Set-up

The project set-up consisted of the following tasks.

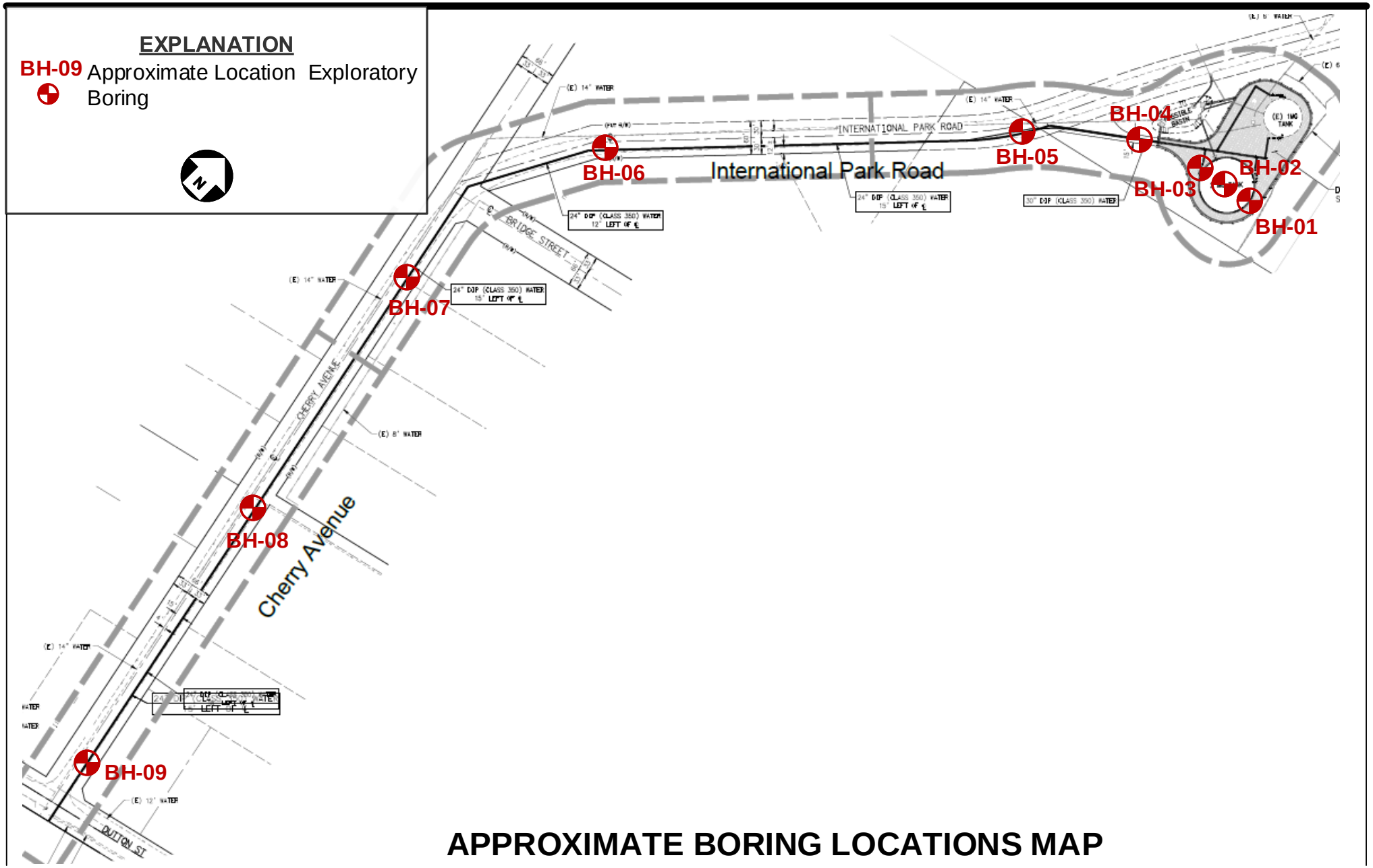
- Conducted a field reconnaissance to map the existing site condition, such as exposed boulders, bedrock, slopes, and drainage pattern.
- Marked the boring locations such that the drill rig access to all locations was available.
- Notified Underground Service Alert (USA) at least 48 hours prior to drilling to clear the boring location of any conflict with existing underground utilities.
- Engaged a California-licensed driller to drill exploratory borings.

4.3 Subsurface Exploration

Three exploratory borings (BH-01 through BH-03) at the tank site were drilled on April 26, 2018. The borings were drilled to the planned maximum depths between 21.5 and 51.0 feet bgs, except for boring BH-02 which was terminated at 45.5 feet bgs due to refusal on suspected bedrock.

Six exploratory borings (BH-04 through BH-09) along the transmission pipeline were drilled on April 26 and June 20, 2018. The borings were drilled to the planned maximum depths between 15.3 and 21.5 feet bgs.

Approximate boring locations are indicated in Figure No. 2, *Approximate Boring Locations Map*. For a description of the field exploration and sampling program, see Appendix A, *Field Exploration*.



APPROXIMATE BORING LOCATIONS MAP

Project: Noble Water Storage Tank No. 2 and Transmission Pipeline
Location: Community of Cherry Valley, Riverside County, California
For: Cozad & Fox, Inc.

Project No.
17-81-258-01

Converse Consultants

Figure No.
2

4.4 Laboratory Testing

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

- *In*-situ moisture contents and dry densities (ASTM D2216 and ASTM D7263)
- Expansion index (ASTM D4829)
- Sand equivalent (ASTM D2419)
- R-value (California Test 301)
- Soil corrosivity (California Tests 643, 422, and 417)
- Collapse potential (ASTM D4546)
- Grain size distribution (ASTM C136)
- Maximum dry density and optimum-moisture content (ASTM D1557)
- Direct shear (ASTM D3080)

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

4.5 Analysis and Report Preparation

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

5.0 SUBSURFACE CONDITIONS

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

5.1 Existing Pavement Sections

The encountered pavement thicknesses were measured and are included in the following table.

Table No. 1, Existing Pavement Sections

Boring No.	Location	Approximate Station	Asphalt Concrete Thickness (in.)	Aggregate Base Thickness (in.)
BH-01	Tank Site	N/A	5.0	0.0
BH-02	Tank Site	N/A	3.5	0.0
BH-03	Tank Site	N/A	0.0	0.0

Boring No.	Location	Approximate Station	Asphalt Concrete Thickness (in.)	Aggregate Base Thickness (in.)
BH-04	Between International Park Rd. and Tank Site	N/A	0.0	0.0
BH-05	International Park Rd.	20+50	2.5	0.0
BH-06	International Park Rd.	11+50	3.0	0.0
BH-07	Cherry Avenue/Shoulder	20+50	0.0	0.0
BH-08	Cherry Avenue/Shoulder	17+50	0.0	0.0
BH-09	Cherry Avenue/Shoulder	10+50	0.0	0.0

(N/A = not applicable)

5.2 Subsurface Profile

Subsurface conditions of the tank site and along the pipeline alignment are presented below.

Tank Site

Based on the exploratory borings and laboratory test results, the subsurface soil at the tank site consisted primarily of alluvial soils consisting of gravelly sand with little silt. Gravel up to 2 inches in largest dimension was observed in all borings. Based on hammer blow counts, the upper 10 feet soils are medium dense to dense. Relative compaction of the upper 10 feet soils varies from 78 (sample disturbed due to presence of gravel) to 92 percent.

Pipeline

Based on the exploratory borings and laboratory test results, the subsurface soil along the pipeline alignment consisted primarily of alluvial soils consisting of gravelly sand with little silt. Some gravel up to 2 inches in largest dimension was observed in all borings. Based on hammer blow counts, the upper 10 feet soils are medium dense to dense. Relative compaction of the upper 10 feet soils varies from 77 (sample disturbed due to presence of gravel) to 92 percent.

For a detailed description of the subsurface materials encountered in the exploratory borings, see Drawings No. A-2 through A-10, Logs of Borings, in Appendix A, Field Exploration.

5.3 Groundwater

Groundwater was not encountered during the investigation to the maximum explored depth of 51.0 feet bgs. Regional conditions were reviewed to estimate expected groundwater depths in the vicinity of the proposed project. Data in the following table was found on the National Water Information System (USGS, 2017a).

Table No. 2, Summary of USGS Groundwater Depth Data

Site No.	Location	Groundwater Depth Range (ft. bgs)	Date Range
335907116580801	NE of Oak Glen Rd and Cherry Oak Rd. Approximately 0.6 miles NW of the tank site.	98-272.5	1995-2000
335903116581001	NE of Oak Glen Rd and Cherry Oak Rd. Approximately 0.6 miles NW of the tank site.	112.5-127.04	2000-2001
335903116580902	E of Oak Glen Rd and Cherry Oak Rd Approximately 0.6 miles NW of the tank site.	80.8-144.99	2000-2017
335834116582101	NW corner of Orchard St and Avenida Miravilla. Approximately 0.65 miles SW of the tank site.	164-201.26	2003-2009
335834116582102	SE corner of Orchard St and Avenida Miravilla. Approximately 0.65 miles SW of the tank site.	91.4-105.2	1998-2009

The Geotracker website (USGS, 2018) was also reviewed, but did not contain any data in the vicinity of the proposed site.

Groundwater is generally expected to be deeper than 50 feet bgs. Dewatering is not expected to be required during the construction of the tank or pipeline. It should be noted that the groundwater level could vary depending upon the seasonal precipitation and possible groundwater pumping activity in the site vicinity. Shallow perched groundwater may be present locally, particularly following precipitation or irrigation events.

5.4 Excavatability

The surface and subsurface soil materials for the proposed development are expected to be excavatable by conventional heavy-duty earth moving and trenching equipment. Excavation will likely be difficult due to the presence of gravel and possible cobbles.

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

5.5 Subsurface Variations

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

6.0 ENGINEERING GEOLOGY

The regional and local geology within the proposed project area are discussed below.

6.1 Regional Geology

The project site is situated near the northern boundary of the Peninsular Ranges Geomorphic Province adjacent to the Traverse Ranges province.

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

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

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

6.2 Local Geology

The tank site is located adjacent to the active wash channel of Noble Creek at the mouth of Cherry Canyon, Cherry Valley, California. The pipeline alignment extends southwest and south approximately 2,800 feet. According to regional mapping (Dibblee and Minch, 2003; Morton and Miller, 2006) the site is underlain by older (early Holocene to late Pleistocene-age) alluvial fan deposits. These deposits are primarily comprised of unconsolidated sand, gravel, and boulders.

The site is adjacent to the south of a bedrock contact. According to regional mapping (Dibblee and Minch, 2003) the bedrock is granitic and consists of quartz diorite. Boring BH-2 was terminated due to refusal at 45 bgs, likely due to encountering the bedrock. Based on

the proximity to the mapped bedrock contact and the refusal encountered in boring BH-2, Bedrock likely underlies the remainder of the site at slightly deeper depths.

7.0 FAULTING AND SEISMICITY

The approximate distance and seismic characteristics of nearby faults as well as seismic design coefficients are discussed in the following subsections.

7.1 Faulting

The geologic map (Dibblee and Minch, 2003) shows a fault mapped crossing the tank site. The fault trace is dotted, indicating the fault is concealed by overlying alluvium. The alluvium is old (Pleistocene-aged), indicating a minimum age of approximately 11,000 years. The fault appears to be a trace of the Banning Fault, which is mapped as inactive.

Riverside County fault zone maps (Riverside County, 2018) do not indicate any active faults or fault zones projecting toward or extending across the tank site. The California Geological Survey Earthquake Fault Zone Map for the Beaumont Quadrangle (CGS, 1995) does not indicate any active faults or fault zones projecting toward or extending across the tank site or pipeline site. An active fault is defined as a fault that has had surface displacement within Holocene time (approximately the last 11,000 years).

Riverside County fault zone maps (Riverside County, 2018) indicate an active fault zone crosses the pipeline alignment from approximately 280 feet south of Bridges Street to the termination of the proposed new alignment at Dutton Street. The county-designated fault zone is associated with the active San Andreas Fault Zone. This fault zone is not present on the California Geological Survey Earthquake Fault Zone Map for the Beaumont Quadrangle (CGS, 1995).

The proposed site is situated in a seismically active region. As is the case for most areas of Southern California, ground shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site.

The potential for surface rupture resulting from the movement of onsite or nearby major faults is not known with certainty but is considered very low. The fault is not designated as active by the State of California or Riverside County. As such, there are no requirements for additional investigations or structural setbacks. The site is considered suitable from a faulting standpoint for the construction of the proposed tank. To further mitigate any risk associated with potential faulting, we recommend that the tank be sited the maximum distance from the mapped trace of the inactive fault that is allowable by property boundary.

The following table contains a list of active and potentially active faults within one hundred (100) kilometers of the subject site. The fault parameters and distances presented in the following table are based on the output from EQFAULT (Blake, 2000), revised in accordance with CGS fault parameters (Cao et. al., 2003).

Table No. 3, Seismic Characteristics of Nearby Active Faults

Fault Name	Approximate Distance (miles (km))	Moment Magnitude (Mw)
San Andreas-Southern	4.7 (7.5)	7.4
San Andreas-San Bernardino	4.7 (7.5)	7.5
San Jacinto-San Jacinto Valley	9.8 (15.8)	6.9
Pinto Mountain	14.7 (23.7)	7.2
San Jacinto-San Bernardino	16.2 (26.0)	6.7
San Jacinto-Anza	16.8 (27.1)	7.2
North Frontal Fault Zone (West)	19.9 (32.1)	7.2
North Frontal Fault Zone (East)	20.4 (32.9)	6.7
Cleghorn	25.2 (40.6)	6.5
Helendale-S. Lockhardt	27.5 (44.3)	7.3
San Andreas-Coachella	28.5 (45.8)	7.2
Cucamonga	31.8 (51.2)	6.9
Lenwood-Lockhart-Old Woman Sprgs	31.9 (51.3)	7.5
Elsinore-Glen Ivy	32.2 (51.9)	6.8
Elsinore-Temecula	32.2 (51.9)	6.8
Burnt Mtn.	32.5 (52.3)	6.5
Landers	33.7 (54.2)	7.3
Eureka Peak	34.0 (54.7)	6.4
Chino-Central Ave. (Elsinore)	37.3 (60.0)	6.7
Johnson Valley (Northern)	37.6 (60.5)	6.7
Whittier	39.8 (64.0)	6.8
San Andreas-Mojave	39.9 (64.2)	7.4
Elsinore-Julian	41.8 (67.3)	7.1
Emerson So.-Copper Mtn.	42.9 (69.0)	7.0
San Jose	43.3 (69.7)	6.4
San Jacinto-Coyote Creek	44.5 (71.6)	6.8
Sierra Madre	45.6 (73.4)	7.2
Calico-Hidalgo	47.8 (76.9)	7.3
Elysian Park Thrust	51.0 (82.0)	6.7
Pisgah-Bullion Mtn.-Mesquite Lk	52.6 (84.6)	7.3
Clamshell-Sawpit	55.3 (89.0)	6.5
Newport-Inglewood (Offshore)	57.7 (92.9)	7.1
Earthquake Valley	59.3 (95.4)	6.5
Compton Thrust	59.8 (96.2)	6.8
Newport-Inglewood (L.A.Basin)	61.0 (98.2)	7.1
Raymond	61.6 (99.1)	6.5
Gravel Hills-Harper Lake	61.8 (99.4)	7.1

7.2 Seismic Design Parameters

Seismic parameters based on the California Building Code (CBSC, 2016) were determined using the Seismic Design Maps application (USGS, 2018b) and are provided in the following table.

Table No. 4, CBC Seismic Parameters

Seismic Parameters	
Site Coordinates	33.9799N, 116.9600W
Site Class	D
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_s	1.673g
Mapped 1-second Spectral Response Acceleration, S_1	0.793g
Site Coefficient (from Table 1613.5.3(1)), F_a	1.0
Site Coefficient (from Table 1613.5.3(2)), F_v	1.5
MCE 0.2-sec period Spectral Response Acceleration, S_{Ms}	1.673g
MCE 1-second period Spectral Response Acceleration, S_{M1}	1.190g
Design Spectral Response Acceleration for short period S_{ds}	1.115g
Design Spectral Response Acceleration for 1-second period, S_{d1}	0.793g
Maximum Peak Ground Acceleration, PGA_M	0.671g

7.3 Site Specific Seismic Analysis

A site-specific response spectrum was developed for the project for a Maximum Considered Earthquake (MCE), defined as a horizontal peak ground acceleration that has a 10 percent probability of being exceeded in 50 years (return period of approximately 474.6 years). Active faults were evaluated. The controlling source was determined to be the USGS 2008 California Gridded Source, with an MCE of Mw 7.0 and a deterministic peak ground acceleration (PGA) of 0.990g.

In accordance with ASCE 7-10, Section 21.2 the site-specific response spectra can be taken as the lesser of the probabilistic maximum rotated component of MCE ground motion and the 84th percentile of deterministic maximum rotated component of MCE ground motion response spectra. The design response spectra can be taken as 2/3 of site-specific MCE response spectra but should not be lower than 80 percent of CBC general response spectra. The risk coefficient C_R has been incorporated at each spectral response period for which the acceleration was computed in accordance with ASCE 7-10, Section 21.2.1.1.

A site-specific response analysis, using faults within 100 kilometers of the site, was developed using the computer program EZ-FRISK (Risk Engineering, 2012) and the 2008

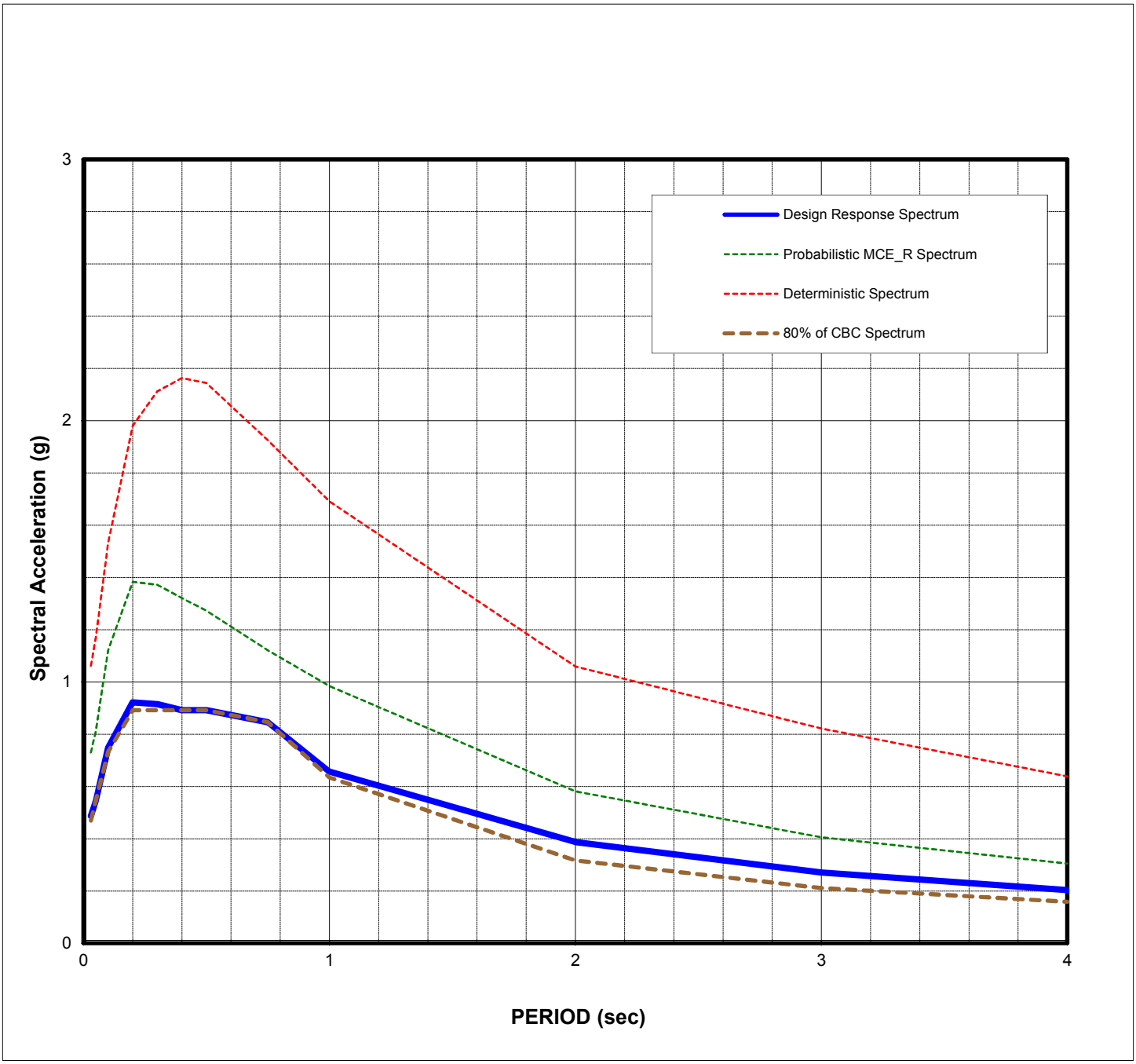
USGS Fault Model database. Attenuation relationships proposed by Boore and Atkinson, Campbell and Bozorgnia, Chiou and Youngs were used in the analysis. These attenuation relationships are based on Next Generation Attenuation (NGA) project model. Maximum rotated components were determined using Huang (2008) method. An average shear wave velocity at upper 30 meters of soil profile (V_{s30}) of 270 meters per second, depth to bedrock of with a shear wave velocity 1,000 meters per second at 50 meters below grade, and depth of bedrock where the shear wave velocity is 2,500 meters per second at 2,000 meters below grade were selected for use in our analysis.

The probabilistic response spectrum results and peak ground acceleration for each attenuation relationship are presented in the following table.

Table No. 5, Probabilistic Response Spectrum Data

Attenuation Relationship	Probabilistic Mean	Boore-Atkinson (2008)	Campbell-Bozorgnia (2008)	Chiou-Youngs (2007)
Peak Ground Acceleration (g)	0.671	0.662	0.602	0.741
Spectral Period (sec)	**10% in 50yr Probabilistic Spectral Acceleration (g)**			
0.03	0.716	0.711	0.633	0.789
0.05	0.796	0.774	0.724	0.888
0.10	1.099	1.082	1.026	1.185
0.20	1.356	1.312	1.259	1.494
0.30	1.352	1.338	1.222	1.492
0.40	1.308	1.323	1.177	1.419
0.50	1.266	1.297	1.173	1.327
0.75	1.129	1.155	1.073	1.156
1.00	1.004	0.961	0.989	1.049
2.00	0.593	0.560	0.637	0.583
3.00	0.414	0.408	0.442	0.389
4.00	0.311	0.306	0.343	0.280

Response spectra data are presented in the following table and on Figure No. 3, *Site Specific Design Response Spectrum.* These curves correspond to the mean of the response values from above attenuation relations for horizontal elastic single-degree-of-freedom systems with equivalent viscous damping of 5 percent of critical damping. Vertical acceleration at the site may be calculated using the ASCE 7-10, Section 12.4.



Note: Calculated using EZFRISK program Risk Engineering, version 7.62
and USGS 2008 fault model database.

SITE SPECIFIC DESIGN RESPONSE SPECTRUM

Noble Water Storage Tank No. 2 and Transmission Pipeline

Community of Cherry Valley, Riverside County, California

For : Cozad and Fox, Inc.

Project Number:

17-81-258-01

Converse Consultants

Figure No.

3

Table No. 6, Site Specific Response Spectrum Data

Period (sec)	10% in 50yr Probabilistic Spectral Acceleration (g)	Risk Coefficient C_R	Probabilistic MCE_R Spectral Acceleration (g)	84th Percentile Deterministic MCE Response Spectra, (g)	Deterministic CBC Lower Level, (g)	Site Specific MCE_R Spectral Acceleration (g)	80% CBC Design Response Spectrum (g)	Site Specific Design Spectral Acceleration (g)
0.03	0.716	1.020	0.730	1.062	0.716	0.730	0.470	0.49
0.05	0.796	1.020	0.812	1.169	0.796	0.812	0.545	0.54
0.10	1.099	1.020	1.121	1.531	1.099	1.121	0.733	0.75
0.20	1.356	1.020	1.383	1.981	1.356	1.383	0.892	0.92
0.30	1.352	1.015	1.372	2.112	1.352	1.372	0.892	0.91
0.40	1.308	1.010	1.321	2.163	1.308	1.321	0.892	0.89
0.50	1.266	1.005	1.272	2.144	1.266	1.272	0.892	0.89
0.75	1.129	0.993	1.121	1.925	1.129	1.121	0.846	0.85
1.00	1.004	0.980	0.984	1.691	1.004	0.984	0.634	0.66
2.00	0.593	0.980	0.581	1.059	0.593	0.581	0.317	0.39
3.00	0.414	0.980	0.405	0.822	0.414	0.405	0.211	0.27
4.00	0.311	0.980	0.305	0.639	0.311	0.305	0.159	0.20

The site-specific design response parameters are provided in the following table. These parameters were determined from Design Response Spectra presented in table above, and following guidelines of ASCE 7-10, Section 21.4.

Table No. 7, Site Specific Seismic Design Parameters

Parameter	Value 0.5% Damping	Value 2% Damping	Value 5% Damping	Value 10% Damping	Lower Limit, 80% of CBC Design Spectra
Site-Specific 0.2-second period Spectral Response Acceleration, S_{MS}	2.407	1.701	1.383	1.148	1.338
Site-Specific1-second period Spectral Response Acceleration, S_{M1}	2.360	1.668	1.356	1.126	0.952
Site-Specific Design Spectral Response Acceleration for short period S_{DS}	1.604	1.134	0.922	0.765	0.892
Site-Specific Design Spectral Response Acceleration for 1-second period, S_{D1}	1.348	0.953	0.775	0.643	0.634

7.4 Secondary Effects of Seismic Activity

In general, secondary effects of seismic activity include surface fault rupture, soil liquefaction, landslides, lateral spreading, and settlement due to seismic shaking, tsunamis, seiches, and earthquake-induced flooding. The site-specific potential for each of these seismic hazards is discussed in the following sections.

Surface Fault Rupture: The site is not located within a currently designated State of California or Riverside County Earthquake Fault Zone (CGS, 1995; Riverside County, 2018). There are no known active faults projecting toward or extending across the project site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

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

Soil liquefaction generally occurs in submerged granular soils and non-plastic silts during or after strong ground shaking. There are several general requirements for liquefaction to occur. They are as follows.

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

The project site is located in an area evaluated as having low liquefaction potential by Riverside County (Riverside County, 2018).

The current and historical high groundwater levels are deeper than 50 feet bgs. Based on a site-specific liquefaction analysis presented in Appendix C, *Liquefaction and Settlement Analyses*, liquefaction potential at the project site is negligible under groundwater conditions deeper than 50 feet bgs.

Seismic Settlement: Seismically-induced settlement occurs in unsaturated, unconsolidated, granular sediments during ground shaking associated with earthquakes. The analysis presented in Appendix C*, Liquefaction and Settlement Analyses* indicates that the site has the potential for up to 3.9 inches of dry seismic settlement.

Landslides: Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. The slopes to the east of the proposed Tank No. 2 site did not show signs of oversteepening or other indications of previous landsliding.

Lateral Spreading: Seismically induced lateral spreading involves primarily lateral movement of earth materials over underlying materials which are liquefied due to ground shaking. It differs from the slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. Due to the low risk for liquefaction and flat nature of site, the risk of lateral spreading is considered low.

Tsunamis: Tsunamis are large waves generated in open bodies of water by fault displacement or major ground movement. Due to the inland location of the site, tsunamis are not considered to be a risk.

Seiches: Seiches are large waves generated in enclosed bodies of water in response to ground shaking. There are no enclosed bodies of water near the project site. Seiching is not considered to be a risk during construction. Once constructed, the onsite tank may be subject to seiching during an earthquake.

Earthquake-Induced Flooding: Dams or other water-retaining structures may fail as a result of large earthquakes. The project site is not located within a designated dam inundation zone (Riverside County, 2015). The risk for earthquake-induced flooding to affect the project site is considered low.

8.0 LABORATORY TEST RESULTS

Results of physical and chemical tests performed for this project are presented below.

8.1 Physical Testing

Results of the various laboratory tests are presented in Appendix B, *Laboratory Testing Program*, except for the results of in-situ moisture and dry density tests which are presented on the Logs of Borings in Appendix A, *Field Exploration*. The results are also discussed below.

Tank Site

- In-situ Moisture and Dry Density – *In-situ* dry density and moisture content of the site soils were determined in accordance to ASTM Standard D2216 and D7263. Dry densities of the upper 10 feet soils ranged from 108 to 127 pcf with moisture contents of 2 to 4 percent. Results are presented in the log of borings in Appendix A, *Field Exploration.*
- Expansion Index – Two representative samples from the upper 10 feet soils were tested to evaluate the expansion potential in accordance with ASTM Standard D4829. The test results showed EI of 0, indicating very low expansion potential.

- Sand Equivalent – One representative bulk soil sample was tested to evaluate sand equivalent (SE) in accordance with the ASTM Standard D2419 test method. The measured sand equivalent was 46.
- Collapse Potential – The collapse potential of one relatively undisturbed sample from the upper 7 feet of soils was tested under a vertical stress of up to 2.0 kips per square foot (ksf) in accordance with the ASTM Standard D4546 test method. The test result showed collapse of 1.7 percent, indicating slight collapse potential.
- Grain Size Analysis – Two representative samples were tested to determine the relative grain size distribution in accordance with the ASTM Standard C136. The test results are graphically presented in Drawing No. B-1, *Grain Size Distribution Results.*
- Maximum Dry Density and Optimum Moisture Content – The result of one typical moisture-density relationship tested in accordance with ASTM D1557 is presented in Drawing No. B-2, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program*. The laboratory maximum dry density with rock correction was 138.0 pounds per cubic foot (pcf) and the optimum moisture content of 7.0 percent.
- Direct Shear – Two direct shear tests were performed in accordance with ASTM Standard D3080 on relatively undisturbed ring samples. The result of the direct shear tests are presented in Drawings No. B-3 and B-4, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.

Pipeline

- In-situ Moisture and Dry Density – *In-situ* dry density and moisture content of the site soils were determined in accordance to ASTM Standard D2216 and D7263. Dry densities of the upper 10 feet soils ranged from 105 to 123 pcf with moisture contents of 1 to 4 percent. Results are presented in the log of borings in Appendix A, *Field Exploration.*
- Sand Equivalent – Three representative bulk soil samples were tested to evaluate sand equivalent (SE) in accordance with the ASTM Standard D2419 test method. The measured sand equivalents were 30, 54 and 63.
- Collapse Potential – The collapse potential of one relatively undisturbed sample from the upper 7 feet of soils was tested under a vertical stress of up to 2.0 kips per square foot (ksf) in accordance with the ASTM Standard D4546 test method. The test result showed collapse of 2.4 percent, indicating moderate collapse potential.
- Grain Size Analysis – Two representative samples were tested to determine the relative grain size distribution in accordance with the ASTM Standard C136. The test results are graphically presented in Drawing No. B-1, *Grain Size Distribution Results.*
- Maximum Dry Density and Optimum Moisture Content – The result of one typical moisture-density relationship tested in accordance with ASTM D1557 is presented in Drawing No. B-2, *Moisture-Density Relationship Result*, in Appendix B, *Laboratory Testing Program*. The laboratory maximum dry density with rock

correction was 136.0 pounds per cubic foot (pcf) and the optimum moisture content of 6.7 percent.

- Direct Shear – One direct shear test was performed in accordance with ASTM Standard D3080 on relatively undisturbed ring samples. The result of the direct shear test is presented in Drawing No. B-5, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.

8.2 Chemical Testing - Corrosivity Evaluation

Four representative soil samples (two from the tank site and two from the pipeline) were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purposes of the tests were to determine the corrosion potential of site soils when placed in contact with common pipe materials. The test was performed by HDR, Inc. (Claremont, CA) and AP Engineering and Testing, Inc. (Pomona, CA) in accordance with California Tests 643, 422, and 417. The test results are presented in Appendix B, *Laboratory Testing Program and summarized below.*

Tank Site

- The pH measurements of the tested samples were 7.5 and 8.0.
- The sulfate contents of the tested samples were 0.0008 and 0.002 percent by weight.
- The chloride concentrations of the tested samples were 2.9 to 6.6 ppm.
- The minimum electrical resistivities when saturated were 8,000 and 12,000 ohm-cm.

Pipeline

- The pH measurements of the tested samples were 6.8 and 7.4.
- The sulfate contents of the tested samples were 0.0002 and 0.004 percent by weight.
- The chloride concentrations of the tested samples were 2.7 and 35 ppm.
- The minimum electrical resistivities when saturated ranged from 4,836 and 22,000 ohm-cm.

9.0 EARTHWORK RECOMMENDATIONS

Earthwork recommendations for the tank site and pipeline are presented in the following sections.

9.1 General

This section contains our general recommendations regarding earthwork and grading for the proposed water storage tank and pipeline. These recommendations are based on the results of our field exploration, laboratory tests, our experience with similar projects, and data evaluation as presented in the preceding sections. These recommendations may

require modification by the geotechnical consultant based on observation of the actual field conditions during grading.

Prior to the start of construction, the existing tank foundation should be demolished. All existing underground utilities and appurtenances, if present, should be located at the tank site and within the vicinity of the alignment. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing structures or utilities.
All debris, surface vegetation, deleterious material, surficial soils containing roots and perishable materials and demolished materials should be stripped and removed from the site.

The final bottom surfaces of all excavations should be observed and approved by the project geotechnical consultant prior to placing any fill. Based on these observations, localized areas may require remedial grading deeper than indicated herein. Therefore, some variations in the depth and lateral extent of excavation recommended in this report should be anticipated.

9.2 Remedial Grading

Tank footings and slab-on-grade should be uniformly supported by compacted fill. In order to provide uniform support, structural areas should be overexcavated, scarified, and recompacted as follows.

Table No. 8, Overexcavation Depths

Structure/Pavement	Minimum Excavation Depth
Tank Footings	24 inches below footings or 5 feet below existing ground surface, whichever is deeper
Slab-on-grade	18 inches below slab

The overexcavation below the footings and slabs-on-grade should be uniform. The overexcavation should extend to at least 2 feet beyond the footprint of the tank footing and slab. The overexcavation bottom should be scarified and compacted as described in Section 9.4, *Compacted Fill Placement*.

If isolated pockets of very soft, loose, eroded, or pumping soil are encountered, the unstable soil should be excavated as needed to expose undisturbed, firm, and unyielding soils.

The contractor should determine the best manner to conduct the excavations, such that there are no losses of bearing and/or lateral support to the existing structures or utilities (if

any). Consideration should be given to using slot cuts or other excavation methods which preserve lateral support during excavation operations near the existing tank.

9.3 Engineered Fill

No fill or base should be placed until excavations and/or natural ground preparation have been observed by the geotechnical consultant. The native soils encountered within the project site are generally considered suitable for re-use as compacted fill. Excavated soils should be processed, including removal of roots and debris, removal of oversized particles, mixing, and moisture conditioning, before placing as compacted fill. On-site soils used as fill should meet the following criteria.

- No particles larger than 3 inches in largest dimension.
- Rocks larger than one inch should not be placed within the upper 12 inches of subgrade soils.
- Free of all organic matter, debris, or other deleterious material.
- Expansion index of 30 or less.
- Sand Equivalent greater than 15 (greater than 30 for pipe bedding).

Imported materials, if required, should meet the following criteria prior to being used as compacted fill.

- Predominantly granular
- No particles larger than 3 inches in largest dimension.
- Free of organic material, loam, trash, or other deleterious material.
- Expansion index of 30 or less.
- Contain less than 30 percent by weight retained in 3/4-inch sieve.
- Contain less than 40 percent fines (passing #200 sieve).

Any imported fills should be tested and approved by geotechnical representative prior to delivery to the site.

9.4 Compacted Fill Placement

All surfaces to receive structural fills should be scarified to a depth of 6 inches. The soil should be moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils. The scarified soils should be recompacted to at least 90 percent of the laboratory maximum dry density.

Fill soils should be thoroughly mixed, and moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils. Fill soils should be evenly spread in horizontal lifts not exceeding 8 inches in uncompacted thickness.

Fill placed within 2 feet of the tank footprint should be compacted to at least 95 percent of the laboratory maximum dry density as determined by ASTM Standard D1557 test

method. Fill placed more than 2 feet outside of the tank footprint should be compacted to at least 90 percent of the laboratory maximum dry density. At least the upper 12 inches of subgrade soils underneath pavements intended to support vehicle loads should be scarified, moisture conditioned, and compacted to at least 95 percent of the laboratory maximum dry density.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

9.5 Backfill Recommendations Behind Subterranean Wall

Compaction of backfill adjacent to structural walls can produce excessive lateral pressures. Improper types and locations of compaction equipment and/or compaction techniques may damage the walls. The use of heavy compaction equipment should not be permitted within a horizontal distance of 5 feet from the wall. Backfill behind any structural walls within the recommended 5-foot zone should be compacted using lightweight construction equipment such as handheld compactors to avoid overstressing the walls. The compaction of wall backfill should be conducted procedure described in Section 9.4 *Compacted Fill Placement.*

9.6 Site Drainage

Adequate positive drainage should be provided away from tank and excavation areas to prevent ponding and to reduce percolation of water into the foundation soils. Surface drainage should be directed to suitable non-erosive devices.

9.7 Utility Trench Backfill

The following sections present earthwork recommendations for utility trench backfill, including subgrade preparation and trench zone backfill.

Open cuts adjacent to existing roadways or structures are not recommended within a 1:1 (horizontal:vertical) plane extending down and away from the roadway or structure perimeter.

Spoils from the trench excavation should not be stockpiled more than 6 feet in height or within a horizontal distance from the trench edge equal to the depth of the trench. Spoils should not be stockpiled behind the shoring, if any, within a horizontal distance equal to the depth of the trench, unless the shoring has been designed for such loads.

9.7.1 Pipeline Subgrade Preparation

The final subgrade surface should be level, firm, uniform, and free of loose materials and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles larger than 2 inches in dimension, if any, should be removed from the trench bottom and replaced with compacted on-site materials.

Any loose, soft and/or unsuitable materials encountered at the pipe subgrade should be removed and replaced with an adequate bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

9.7.2 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 1 foot above the pipe. Pipe bedding should follow the County of Riverside Standard No. 818, *Utility Trench Backfill* (attached in Appendix D). Besides, additional information for pipe bedding are provided below.

To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material. The sand equivalent of the tested soils varies from 30 to 63. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. Based on laboratory test results, the soils along the alignment may be suitable for use as bedding material. The pipe designer should determine if the soils are suitable as pipe bedding material.

The type and thickness of the granular bedding placed underneath and around the pipe, if any, should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe.

Bedding materials should be vibrated in-place to achieve compaction. Care should be taken to densify the bedding material below the springline of the pipe. Prior to placing the pipe bedding material, the pipe subgrade should be uniform and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

Migration of fines from the surrounding native and/or fill soils must be considered in selecting the gradation of any imported bedding material. We recommend that the pipe bedding material should satisfy the following criteria to protect migration of fine materials.

i. $\frac{D15(F)}{D85(B)} \leq 5$

ii. $\frac{D50(F)}{D50(B)} < 25$

iii. Bedding Materials must have less than 5 percent minus 75 µm (No. 200) sieve to avoid internal movement of fines.

Where,

F = Bedding Material
B = Surrounding Native and/or Fill Soils
*D*15(F) = Particle size through which 15% of bedding material will pass
*D*85(B) = Particle size through which 85% of surrounding soil will pass
*D*50(F) = Particle size through which 50% of bedding material will pass
*D*50(B) = Particle size through which 50% of surrounding soil will pass

If the above criteria does not satisfy, commercially available geofabric used for filtration purposes (such as Mirafi 140N or equivalent) may be wrapped around the bedding material encasing the pipe to separate the bedding material from the surrounding native or fill soils.

9.7.3 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. Excavated on-site soils free of oversize particles and deleterious matter may be used to backfill the trench zone. Trench backfill should follow the County of Riverside Standard No. 818, *Utility Trench Backfill* (attached in Appendix D). Besides, additional trench backfill recommendations are presented below.

- Trench excavations to receive backfill should be free of trash, debris or other unsatisfactory materials at the time of backfill placement.
- Trench zone backfill should be compacted to at least 90 percent of the laboratory maximum dry density as per ASTM D1557 test method. Trench backfill within 5 feet of the tank footprint and at least the upper 1 foot of trench backfill underlying pavement should be compacted to at least 95 percent of the laboratory maximum dry density as per ASTM D1557 test method.
- Particles larger than 1 inch should not be placed within 12 inches of the pavement subgrade. No more than 30 percent of the backfill volume should be larger than ¾-inch in the largest dimension. Gravel should be well mixed with finer soil. Rocks larger than 3 inches in the largest dimension should not be placed as trench backfill.
- Trench backfill should be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers or mechanical tampers to achieve the density specified herein. The backfill materials should be brought to within ± 3 percent of optimum moisture content for coarse-grained soil, and between optimum and 2 percent above

optimum for fine-grained soil, then placed in horizontal layers. The thickness of uncompacted layers should not exceed 8 inches. Each layer should be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.

- The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, structures, utilities and completed work.
- The field density of the compacted soil should be measured by the ASTM Standard D1556 (Sand Cone) or ASTM D6938 (Nuclear Gauge) or equivalent.
- Observations and field tests should be performed by the project soils consultant to confirm that the required degree of compaction has been obtained. Where compaction is less than that specified, additional compactive effort should be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.
- It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.
- Trench backfill should not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations should not resume until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are in compliance with project specifications.

10.0 DESIGN RECOMMENDATIONS

Based on our field exploration, laboratory testing and analyses of subsurface conditions within the project area, the proposed water storage tank and pipeline may be founded on native materials or compacted fill prepared as described in this report.

Pipelines connected to the lower levels of rigid structures may be subjected to significant loads as backfill is placed to finish grade. We recommend that provisions be incorporated in the design to provide support of such pipelines where they exit the structure. Consideration can be given to flexible connections, concrete slurry support beneath the pipes where they exit the structures, overlaying the pipes with a few inches of compressible material, (e.g., Styrofoam), or other techniques.

The various design recommendations provided in this section are based on the assumption that the above earthwork and grading recommendations will be implemented in the project design and construction.

10.1 Shallow Foundation Design Parameters

The proposed water storage tank may be supported on a continuous spread footing (ring foundation) and/or isolated spread footings. The design of the shallow foundations should be based on the recommended parameters presented in the table below.

Table No. 9, Recommended Foundation Parameters

Parameter	Value
Minimum continuous spread footing width	18 inches
Minimum isolated footing width	18 inches
Minimum continuous or isolated footing depth of embedment below lowest adjacent grade	18 inches
Allowable net bearing capacity	2,000 psf

The footing dimensions and reinforcement should be based on structural design. The allowable bearing capacity can be increased by 500 psf with each foot of additional embedment and 150 psf with each foot of additional width up to a maximum of 3,000 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity. If normal code requirements are applied for design, the above vertical bearing value may be increased by 33 percent for short duration loadings, which will include loadings induced by wind or seismic forces.

10.2 Lateral Earth Pressures and Resistance to Lateral Loads

In the following subsections, the lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils strength parameters obtained from laboratory testing.

10.2.1 Active Earth Pressures

The active earth pressure behind any buried wall or foundation depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall or foundation inclination, surcharges, and any hydrostatic pressures. The lateral earth pressures for level backfill and without surcharge for the project site are presented in the following tables.

Table No. 10, Active and At-Rest Earth Pressures

Loading Conditions	Lateral Earth Pressure (psf)
Active earth conditions (wall is free to deflect at least 0.001 radian)	40
At-rest (wall is restrained)	60

These pressures assume a level ground surface behind the walls for a distance greater than the wall height, no surcharge and no hydrostatic pressure. If water pressure is allowed to build up behind the walls, the active pressures should be reduced by 50 percent and added to a full hydrostatic pressure to compute the design pressures against the walls.

10.2.2 Passive Earth Pressure

Resistance to lateral loads can be assumed to be provided by a combination of friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.35 between formed concrete and soil may be used with the dead load forces. An allowable passive earth pressure of 230 psf per foot of depth may be used for the sides of footing poured against recompacted native soils. A factor of safety of 1.5 was applied in calculating passive earth pressure. The maximum value of the passive earth pressure should be limited to 2,000 psf.

Vertical and lateral bearing values indicated above are for the total dead loads and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing and lateral resistance values may be increased by 33 percent for short duration loading, which will include the effect of wind or seismic forces.

Due to the low overburden stress of the soil at shallow depth, the upper 1 foot of passive resistance should be neglected unless the soil is confined by pavement or slab.

10.2.3 Seismic Earth Pressure

The equivalent fluid seismic pressure was calculated using Seed and Whitman (1970) procedure. The seismic force applied to the wall is based on a horizontal seismic acceleration coefficient equal to one-third of the peak ground acceleration in accordance with Caltrans Bridge Design Specifications (Caltrans, 2004). An equivalent fluid seismic pressure of 30H pcf may be assumed under active loading conditions at the top of an inverted triangle pressure distribution where H is the height of the backfill behind the wall. Under at-rest conditions, the active equivalent fluid seismic pressure should be increased by 30 percent.

10.3 Settlement

The total settlement of shallow footings from static structural loads and short-term settlement of properly compacted fill is anticipated to be 0.5 inch or less. The differential settlement resulting from static loads is anticipated to be 0.5 inches or less over a horizontal distance of 40 feet.

Our analysis of the potential dynamic settlement is presented in Appendix C, *Liquefaction and Settlement Analyses*. We estimate that the tank site has the potential for up to 3.9 inches of dry seismic settlement during a large earthquake. BH-02 and BH-03 were approximately 60 feet apart. The estimated total dynamic settlements in the borings are 3.89 and 3.09 inches. The difference between these estimated settlements is 0.8 inches. Based on these values, the estimated dynamic differential settlement is up to 0.6 inches over a horizontal distance of 40 feet.

The static and dynamic settlement estimates should not be combined for design purposes. The maximum combined static and dynamic settlement is not anticipated to exceed the maximum anticipated dynamic settlement.

10.4 Pipe Design Parameters

Structural design of pipelines requires proper evaluation of all possible loads acting on pipes. The stresses and strains induced on buried pipes depend on many factors, including the type of soil, density, bearing pressure, angle of internal friction, coefficient of passive earth pressure, and coefficient of friction at the interface between the backfill and native soils. The recommended values of the various soil parameters for the pipe design are provided in Table No. 11, *Soil Parameters for Pipe Design*.

Where pipelines are connecting to rigid structures near, or at its lower levels, and then are subjected to significant loads as the backfill is placed to finish grade, we recommend that provisions be incorporated in the design to provide support of these pipelines where they exit the structure. Consideration can be given to flexible connections, concrete slurry support beneath the pipes where they exit the structures, overlaying and supporting the pipes with a few inches of compressible material, (i.e. Styrofoam, or other materials), or other techniques. Automatic shut-offs should be installed to limit the potential leakage in the event of damage in a seismic event.

Table No. 11, Soil Parameters for Pipe Design

Soil Parameters	Parameters
Unit weight of compacted backfill (assuming 92% average relative compaction), γ	136 pcf
Angle of internal friction of soils, ϕ	30º
Soil cohesion, c	0 pcf
Coefficient of friction between concrete and native soils, fs	0.35
Coefficient of friction between pipe and native soils, fs	0.25 for metal pipe
Bearing pressure against Alluvial Soils	2,000 psf
Coefficient of passive earth pressure, Kp	3.25
Coefficient of active earth pressure, Ka	0.31
Modulus of Soil Reaction, E’	1000 psi

10.5 Bearing Pressure for Anchor and Thrust Blocks

An allowable net bearing pressure presented in Table No. 11, *Soil Parameters for Pipe Design* may be used for anchor and thrust block design against alluvial soils. Such thrust blocks should be at least 18 inches wide.

If normal code requirements are applied for design, the above recommended bearing capacity and passive resistances may be increased by 33 percent for short duration loading such as seismic or wind loading.

10.6 Soil Corrosivity

Four representative soil samples (2 from tank site and 2 from pipeline) were evaluated for corrosivity with respect to common construction materials such as concrete and steel. The test results are presented in Appendix B, *Laboratory Testing Program* and design recommendations pertaining to soil corrosivity are presented below.

The sulfate contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category S0 for these sulfate concentrations (ACI 318-14, Table 19.3.1.1). No concrete type restrictions are specified for exposure category S0 (ACI 318-14, Table 19.3.2.1). A minimum compressive strength of 2,500 psi is recommended.

We anticipate that concrete structures such as footings, slabs, and flatwork will be exposed to moisture from precipitation and irrigation. Based on the site locations and the results of chloride testing of the site soils, we do not anticipate that concrete structures will be exposed to external sources of chlorides, such as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-14, Table 19.3.1.1). ACI provides concrete design recommendations in ACI 318-14, Table 19.3.2.1, including a compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent.

The measured value of the minimum electrical resistivity of the sample when saturated ranged from 4,836 to 22,000 Ohm-cm. This indicates that the soils tested of are moderately corrosive to mildly corrosive to ferrous metals in contact with the soil (Romanoff, 1957). Converse does not practice in the area of corrosion consulting. A qualified corrosion consultant should provide appropriate corrosion mitigation measures, if necessary, for any ferrous metals in contact with the site and site soils.

10.7 Asphalt Concrete Pavement

One representative soil sample was tested to determine the R-value of the subgrade soils. The tested R-value was 55. For pavement design, we have utilized an R-value of 50 and design Traffic Indices (TIs) ranging from 5.5 to 8.

Based on the above information, asphalt concrete and aggregate base thickness results are presented using the Caltrans Highway Design Manual (Caltrans, 2017), Chapter 630 with a safety factor of 0.2 for Asphalt Concrete/Aggregate Base section and 0.1 for full depth Asphalt Concrete section. Preliminary asphalt concrete pavement sections are presented in the following table below.

Table No. 12, Recommended Preliminary Pavement Sections

	Traffic Index (TI)	Pavement Section		
		Asphalt Concrete (inches)	Aggregate Base (inches)	Full AC Section (inches)
R-value 50	5.5	3.5	6.0	5.5
	6.5	4.0	6.0	6.5
	7.0	4.5	7.0	7.5
	8.0	5.5	8.0	8.5

At or near the completion of grading, subsurface samples should be tested to evaluate the actual subgrade R-value for final pavement design.

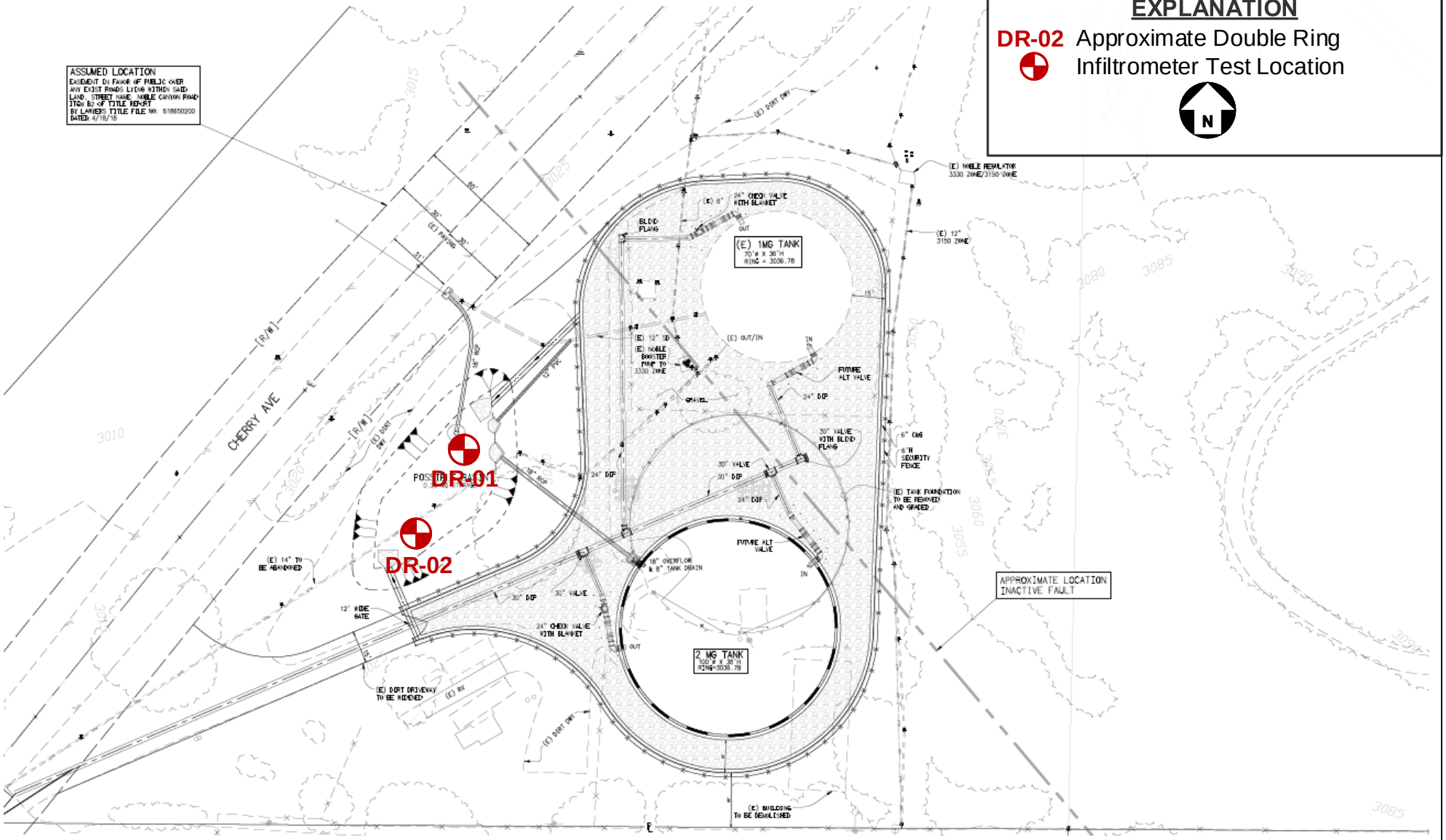
Prior to placement of aggregate base, at least the upper 12 inches of subgrade soils should be scarified, moisture-conditioned if necessary, and recompacted to at least 95 percent of the laboratory maximum dry density as defined by ASTM Standard D1557 test method.

Base materials should conform with Section 200-2.2,"*Crushed Aggregate Base*," of the current Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2015) or the standard of County of Riverside and should be placed in accordance with Section 301.2 of the SSPWC.

Asphaltic concrete materials should conform to Section 203 of the SSPWC or the standard of County of Riverside and should be placed in accordance with Section 302.5 of the SSPWC.

10.8 Infiltration Rate

Two double-ring infiltrometer tests (DR-01 and DR-02) were performed on August 21 and 27, 2019 to evaluate water quality infiltration of the surface soils. The test locations are presented in Figure No. 4, *Approximate Double Ring Infiltrometer Test Locations*. The estimated infiltration rates at the test locations are presented in the following table.



APPROXIMATE DOUBLE RING INFILTROMETER TEST LOCATIONS MAP

Project: Noble Water Storage Tank No. 2 and Transmission Pipeline
Location: Community of Cherry Valley, Riverside County, California
For: Cozad & Fox, Inc.

Project No.
17-81-258-01

Converse Consultants

Figure No.
4

Table No. 13, Double Ring Infiltrometer Test Results

Test No.	Depth of Test Pit	Recommended Design Infiltration Rate (inches/hour)	Factor of Safety (FOS)	Recommended Design Infiltration Rate (inches/hr) with FOS	Average Design Infiltration Rate for Field
DR-01	Ground Surface	2.49	3	0.83	0.85
DR-02	Ground Surface	2.62		0.87	
DR-01	Ground Surface	2.49	2	1.25	1.28
DR-02	Ground Surface	2.62		1.31	

10.8.1 Data Interpretation

The measured tests data are shown on Plates No. 1 and 3, *Estimated Infiltration Rate from Double-Ring Infiltrometer Test Data* and Plates No. 2 and 4, *Infiltration Rate Versus Time* in Appendix E *Double Ring Infiltrometer Testing*. The lowest measurement was selected for each test as the most conservative infiltration rate. Typically, the first several measurement periods should be disregarded as the soil is undergoing saturation and stabilization. Additionally, if all of the water in a cylinder infiltrates in less than an interval of time, the reading will be low. Abnormally high readings over the first several measurement periods can be attributed to stabilization of the water levels and saturation of the surficial soils. Anomalous readings have been omitted from the graphs.

Based on the calculated infiltration rate from double ring infiltrometer test, the design infiltration rate for the site is 0.85 in/hr and 1.28 in/hr for a factor of safety of 3 and 2, respectively. Selection of factor of safety should be based on design engineer.

11.0 CONSTRUCTION RECOMMENDATIONS

Temporary sloped excavation and shoring design recommendations are presented in the following sections.

11.1 General

Prior to the start of construction, all existing underground utilities should be located at the tank site and within the vicinity of the pipeline alignment. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

Both sloped and vertical braced excavations can be considered for the foundations of the tank and pipelines. Sloped excavations may not be feasible in locations adjacent to

existing utilities or structures, including utilities, or other improvement. Recommendations pertaining to temporary excavations are presented in this section.

Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

Excavations near existing structures may require vertical side wall excavation. Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met. The soils exposed in cuts should be observed during excavation by the geotechnical consultant and the competent person designated by the contractor. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

11.2 Temporary Sloped Excavations

Temporary open-cut trenches may be constructed with side slopes as recommended in the following table. Temporary cuts encountering soft and wet fine-grained soils; dry loose, cohesionless soils or loose fill from trench backfill may have to be constructed at a flatter gradient than presented below.

Table No. 14, Slope Ratios for Temporary Excavations

Soil Type	Depth of Excavation (ft)	Recommended Maximum Slope (Horizontal:Vertical)[1]
Gravelly Sand (SP)	0-4	1:1
	4-10	1.5:1

[1] Slope ratio assumed to be uniform from top to toe of slope.

For steeper temporary construction slopes or deeper excavations, or unstable soil encountered during the excavation, shoring or trench shields should be provided by the contractor to protect the workers in the excavation. Design recommendations for temporary shoring are provided in the following section.

Surfaces exposed in slope excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5 feet of the unsupported slope edge. Stockpiled soils with a height higher than 6 feet will require greater distance from trench edges.

11.3 Shoring Design

Temporary shoring will be required where open sloped excavations will not be feasible due to unstable soils or due to nearby existing structures or facilities. Temporary shoring may consist of conventional soldier piles and lagging or sheet piles. The shoring for the pipe excavations may be laterally supported by walers and cross bracing or may be cantilevered. Drilled excavations for soldier piles will require the use of drilling fluids to prevent caving and to maintain an opened hole for pile installation.

The active earth pressure behind any shoring depends primarily on the allowable movement, type of backfill materials, backfill slopes, wall inclination, surcharges, and any hydrostatic pressures.

The lateral earth pressures to be used in the design of shoring is presented in the following table.

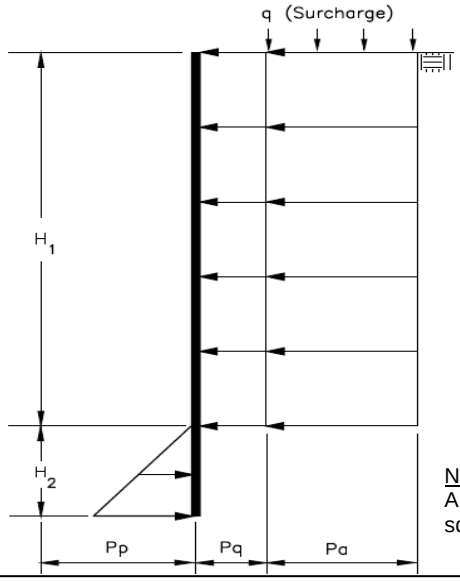
Table No. 15, Lateral Earth Pressures for Temporary Shoring

Lateral Resistance Soil Parameters*	Values
Active Earth Pressure (Braced Shoring) (psf) (A)	24
Active Earth Pressure (Cantilever Shoring) (psf) (B)	40
At-Rest Earth Pressure (Cantilever Shoring) (psf) (C)	60
Passive earth pressure (psf per foot of depth) (D)	230
Maximum allowable bearing pressure against native soils (psf) (E)	2,000
Coefficient of friction between sheet pile and native soils, fs (degree) (F)	0.30

* Parameters A through F are used in Figures No. 4 and 5 below.

Restrained (braced) shoring systems should be designed based on Figure No. 5, *Lateral Earth Pressure for Temporary Braced Excavation* to support a uniform rectangular lateral earth pressure.

Figure No. 5, Lateral Earth Pressures for Temporary Braced Excavation



Total Earth Pressure, P

P = Pq + Pa

Pq = 0.5q - incremental surcharge pressure

Pa = (A)H_1 - active earth pressure (Braced walls)

Lateral Pressure Resistance

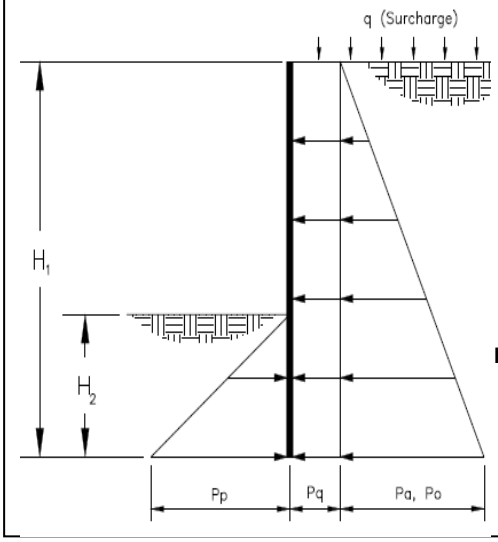
Pp = (D) H_2 ≤ (E) psf - passive earth pressure (on native soils)

μ = (F) - ultimate friction coefficient between steel sheet piles and soil

Note:
All values of height (H) in feet, pressure (P) and surcharge (q) in pounds per square foot (psf).

Unrestrained (cantilever) design of cantilever shoring consisting of soldier piles spaced at least two diameters on-center or sheet piles, can be based on Figure No. 6, *Lateral Earth Pressures on Temporary Cantilever Wall*.

Figure No. 6, Lateral Earth Pressures on Temporary Cantilever Wall



Total Earth Pressure, P

P = Pq + Pa, Po

Pq = 0.5q - incremental surcharge pressure

Pa = (B)H_1 - active earth pressure (Un-restrained)

Po = (C)H_1 - at rest earth pressure (Restrained)

Lateral Pressure Resistance

Pp = (D) H_2 ≤ (E) psf - passive earth pressure (on native soils)

μ = (F) - ultimate friction coefficient between steel sheet piles and soil

Note:
All values of height (H) in feet, pressure (P) and surcharge (q) in pounds per square foot (psf).

The provided pressures assume no hydrostatic pressures. If hydrostatic pressures are allowed to build up, the incremental earth pressures below the ground-water level should be reduced by 50 percent and added to hydrostatic pressure for total lateral pressure.

Passive resistance includes a safety factor of 1.5. The upper 1 foot for passive resistance should be ignored unless the surface is confined by a pavement or slab.

In addition to the lateral earth pressure, surcharge pressures due to miscellaneous loads, such as soil stockpiles, vehicular traffic or construction equipment located adjacent to the shoring, should be included in the design of the shoring. A uniform lateral pressure of 100 psf should be included in the upper 10 feet of the shoring to account for normal vehicular and construction traffic within 10 feet of the trench excavation. As previously mentioned, all shoring should be designed and installed in accordance with state and federal safety regulations.

The contractor should have provisions for soldier pile and sheet pile removal. All voids resulting from removal of shoring should be filled. The method for filling voids should be selected by the contractor, depending on construction conditions, void dimensions and available materials. The acceptable materials, in general, should be non-deleterious, and able to flow into the voids created by shoring removal (e.g. concrete slurry, “pea” gravel, etc.).

Excavations should not extend below a 1:1 (horizontal:vertical) plane extending from the bottom of any existing structures, utility lines or streets. Any proposed excavation should not cause loss of bearing and/or lateral supports of the existing utilities or streets.

If the excavation extends below a 1:1 (horizontal:vertical) plane extending from the bottom of the existing structures, utility lines or streets, a maximum of 10 feet of slope face parallel to the existing improvement should be exposed at a time to reduce the potential for instability. Backfill should be accomplished in the shortest period of time and in alternating sections.

12.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

The project geotechnical consultant should review plans and specifications as the project design progresses. Such review is necessary to identify design elements, assumptions, or new conditions which require revisions or additions to our geotechnical recommendations.

The project geotechnical consultant should be present to observe conditions during construction. Geotechnical observation and testing should be performed as needed to verify compliance with project specifications. Additional geotechnical recommendations may be required based on subsurface conditions encountered during construction.

13.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Cozad and Fox, Inc. and their authorized agents, to assist in the design and construction of the proposed project. Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

Converse Consultants is not responsible or liable for any claims or damages associated with interpretation of available information provided to others. Site exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed and the recommendations of this report are modified or verified in writing. In addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. Converse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

As the project evolves, continued consultation and construction monitoring by a qualified geotechnical consultant should be considered an extension of geotechnical investigation services performed to date. The geotechnical consultant should review plans and specifications to verify that the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this report are valid. Where significant design changes occur, Converse may be required to augment or modify the recommendations presented herein. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and, possibly, modified recommendations.

Design recommendations given in this report are based on the assumption that the recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

14.0 REFERENCES

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Appendix A

Field Exploration

APPENDIX A

FIELD EXPLORATION

Our field investigation included a site reconnaissance and a subsurface exploration program consisting of drilling soil borings. During the site reconnaissance, the surface conditions were noted, and the approximate locations of the test borings were established using existing site and boundary features as reference. The locations should be considered accurate only to the degree implied by the method used.

Three exploratory borings (BH-01 through BH-03) at the tank site were drilled on April 26, 2018. The borings were drilled to the planned maximum depths between 21.5 and 51.0 feet bgs, except for boring BH-02 which was terminated at 45.5 feet bgs due to refusal on suspected bedrock.

Six exploratory borings (BH-04 through BH-09) along the transmission pipeline were drilled on April 26 and June 20, 2018. The borings were drilled to the planned maximum depths between 15.3 and 21.5 feet bgs.

The borings were advanced using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers for soils sampling. Encountered materials were continuously logged by a Converse geologist and classified in the field by visual classification in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140 pound driving weight falling 30 inches. Blow counts at each sample interval are presented on the boring logs. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Bulk samples of typical soil types were also obtained.

Standard Penetration Testing (SPT) was also performed in accordance with the ASTM Standard D1586 test method in boring BH-02 at depths of 20, 30 and 40 feet bgs and in boring BH-03 at depths of 20, 30, 40 and 50 feet bgs using a standard (1.4 inches inside diameter and 2.0 inches outside diameter) split-barrel sampler. The mechanically driven hammer for the SPT sampler was 140 pounds, falling 30 inches for each blow. The recorded blow counts for every 6 inches for a total of 1.5 feet of sampler penetration are shown on the Logs of Borings.

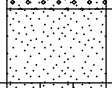
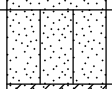
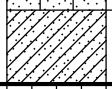
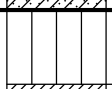
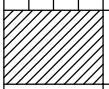
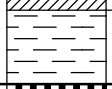
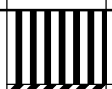
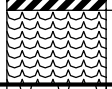
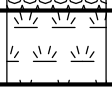
The exact depths at which material changes occur cannot always be established accurately. Unless a more precise depth can be established by other means, changes in

material conditions that occur between drive samples are indicated on the logs at the top of the next drive sample.

Following the completion of logging and sampling, the borings were backfilled with soil cuttings and tamped. The surface may settle over time, if construction is delayed. Therefore, we recommend the owner monitor the boring locations and backfill any depressions that might occur, or provide protection around the boring locations to prevent trip and fall injuries from occurring near the area of any potential settlement.

For a key to soil symbols and terminology used in the boring logs, refer to Drawing No. A-1, *Unified Soil Classification and Key to Boring Log Symbols*. For logs of borings, see Drawings No. A-2 through A-10, *Logs of Borings*.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

BORING LOG SYMBOLS

SAMPLE TYPE

STANDARD PENETRATION TEST
Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method

DRIVE SAMPLE 2.42" I.D. sampler (CMS).

DRIVE SAMPLE No recovery

BULK SAMPLE

GROUNDWATER WHILE DRILLING

GROUNDWATER AFTER DRILLING

LABORATORY TESTING ABBREVIATIONS			
TEST TYPE (Results shown in Appendix B)		STRENGTH	
		Pocket Penetrometer	p
		Direct Shear	ds
		Direct Shear (single point)	ds*
		Unconfined Compression	uc
CLASSIFICATION		Triaxial Compression	tx
Plasticity	pi	Vane Shear	vs
Grain Size Analysis	ma		
Passing No. 200 Sieve	wa	Consolidation	c
Sand Equivalent	se	Collapse Test	col
Expansion Index	ei	Resistance (R) Value	r
Compaction Curve	max	Chemical Analysis	ca
Hydrometer	h	Electrical Resistivity	er
Disturb	Dist.	Permeability	perm
		Soil Cement	sc

Apparant Density	Very Loose	Loose	Medium	Dense	Very Dense
SPT (N)	< 4	4 - 11	11 - 30	31 - 50	> 50
CA Sampler	< 5	5 - 12	13 - 35	36 - 60	> 60
Relative Density (%)	< 20	20 - 40	40 - 60	60 - 80	> 80

Consistency	Very Soft	Soft	Medium	Stiff	Very Stiff	Hard
SPT (N)	< 2	2-4	5-8	9-15	16-30	> 30
CA Sampler	< 3	3-6	7-12	13-25	26-50	> 50

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. **17-81-258-01**

Drawing No. **A-1**

Log of Boring No. BH-01/TANK

Dates Drilled: 4/26/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3,040 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		5" ASPHALT CONCRETE/NO AGGREGATE BASE						ma
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, some gravel up to 1" in largest dimension, little silt, yellowish brown.	■		8/10/17	3	112	
5		- brown	■		17/21/24	3	121	ds
		- some gravel up to 2" in largest dimension, reddish-brown	■		12/20/26	4	123	
10			■		10/15/11	3	124	
15			■		9/12/15	2	109	
20			■		15/29/50-5"	1	126	
		End of boring at 21.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings, tamped, and surface patched with asphalt concrete on 4/26/2018.						

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Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-2

Log of Boring No. BH-02/TANK

Dates Drilled: 4/26/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3,039 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		3.5" ASPHALT CONCRETE/NO AGGREGATE BASE						ca, er, max
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, some gravel up to 1.5" in largest dimension, yellowish brown.	■		8/16/19	2	115	
5			■		9/12/21	3	110	col ei
		- reddish brown	■		16/16/12	3	118	
10		- little silt	■		8/10/12	5	117	
15		- some gravel up to 2" in largest dimension, brown	■		25/35/22	2	114	
20			⊠		10/12/30			
25			■		25/29/30	3	124	
30			⊠		10/10/13			

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Converse Consultants

Project No. 17-81-258-01

Drawing No. A-3a

Log of Boring No. BH-02/TANK

Dates Drilled: 4/26/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3,039 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, some gravel up to 1" in largest dimension, little silt, brown.	■		14/14/20	7	122	
40		-hard drilling	☒		25/50-6"			
45					50-3"			
		End of boring at 45.5 feet bgs due to refusal on suspected bedrock. No groundwater encountered. Borehole backfilled with soil cuttings, tamped, and surface patched with asphalt concrete on 4/26/2018.						

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-3b

Log of Boring No. BH-03/TANK

Dates Drilled: 4/26/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3,041 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, few gravel up to 1" in largest dimension, little silt, brown.	■		6/9/10	3	127	
5			■	▨	7/8/11	2	114	ds ei, ca, er, se, ma
		- some gravel up to 1.5" in largest dimension,	■	▨	9/12/13	2	108	
10			■	▨	21/37/41	1	120	
		-rig chatter		▨				
15			■		23/18/27	2	110	
20			⊠		18/18/26			
25			■		14/21/24	2	111	
		-rig chatter						
30			⊠		12/24/24			

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Converse Consultants

Project No. 17-81-258-01

Drawing No. A-4a

Log of Boring No. BH-03/TANK

Dates Drilled: 4/26/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3,041 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, some gravel up to 1" in largest dimension, brown.	■		30/50-5"	2	121	
40			☒		21/50-5"			
45			■		50-5"	2	113	
50			☒		25/50-5"			
		End of boring at 51 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 4/26/18.						

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-4b

Log of Boring No. BH-04/PIPELINE

Dates Drilled: 4/26/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3,029 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, some gravel up to 2" in largest dimension, brown.						se
			■		13/17/10	3	125	
5			■		13/13/14	4	108	col
			■		4/8/7	2	105	
10			■		11/14/22	1	118	
								ca, er,
15			■		19/35/37	1	120	
20			■		20/24/40	2	115	
		End of boring at 21.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 4/26/2018.						

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-5

Log of Boring No. BH-05/PIPELINE

Dates Drilled: 4/26/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3,018 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		2.5" ASPHALT CONCRETE/ NO AGGREGATE BASE						
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, gravel up to 1.5" in largest dimension, brown.						
5					50-4"			
		- some gravel up to 2" in largest dimension, brown			38/40/45	2	122	se, ma
10					22/31/50-4"	1	124	
15					28/50-4"			
		-rig chatter						
20					34/50-2"	1	126	
		End of boring at 20.7 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings, tamped and surface patched with asphalt concrete on 4/26/2018.						

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-6

Log of Boring No. BH-06/PIPELINE

Dates Drilled: 6/20/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3014 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		3" ASPHALT CONCRETE/NO AGGREGATE BASE						r
		ALLUVIUM						
		GRAVELLY SAND (SP): fine to coarse-grained, gravel up to 1" in largest dimension, brown.	■		16/18/22	1	123	
5		- some cobbles up to 4" in largest dimension	■		15/30/50-4"	1	117	
			■		17/23/24	1	123	ds
10					39/50-5"			
15					50-4"			
		End of boring at 15.3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings, tamped and surface patched with asphalt concrete on 6/20/2018.						

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-7

Log of Boring No. BH-07/PIPELINE

Dates Drilled: 6/20/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2987 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, gravel up to 1" in largest dimension, brown.	■		6/18/18	1	116	
5		- reddish brown	■		15/18/23	2	117	ca, er, max
			■		16/24/28	2	110	
10		- little silt	■		12/23/50-5"	5	128	
15			■		25/42/50-4"	3	121	
		End of boring at 16.3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 6/20/2018.						

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-8

Log of Boring No. BH-08/PIPELINE

Dates Drilled: 6/20/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2967 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **GRAVELLY SAND (SP):** fine to coarse-grained, some gravel up to 1.5" in largest dimension, brown.						se, ma
5					8/13/12	2	111	
					18/23/23	2	113	
10					29/30/27	2	114	
15		-reddish-brown			28/50-5"	2	112	
		End of boring at 16.0 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 6/20/2018.						

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-9

Log of Boring No. BH-09/PIPELINE

Dates Drilled: 6/20/2018 Logged by: Michael Maldonado Checked By: Scot Mathis

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2943 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM						
		GRAVELLY SAND (SP): fine to coarse-grained, few gravel up to 0.5" in largest dimension, brown.						
5			■		7/13/18	2	112	
		-rig chatter	■		10/18/27	1	109	
10			■		33/50-6"	1	107	
15			■		30/50-4"	2	95	
		End of boring at 15.85 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and tamped on 6/20/2018.						

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. 17-81-258-01

Drawing No. A-10

Appendix B

Laboratory Testing Program

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their physical properties and engineering characteristics. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings, in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

***In-Situ* Moisture Content and Dry Density**

Results of these tests performed in accordance with ASTM Standard D2216 and ASTM Standard D7263 on relatively undisturbed ring samples were used to aid in the classification and to provide quantitative measure of the *in situ* dry density and moisture content. Data obtained from this test provides qualitative information on strength and compressibility characteristics of the site soils. For test results, see the Logs of Borings in Appendix A, *Field Exploration*.

Expansion Index

Two representative bulk samples were tested to evaluate the expansion potential. The tests were conducted in accordance with ASTM Standard D4829. The test results are presented in the following table.

Table No. B-1, Expansion Index Test Results

Boring No./ Location	Depth (feet)	Soil Description	Expansion Index	Expansion Potential
BH-02/Tank	5-10	Gravelly Sand (SP)	0	Very Low
BH-03/Tank	5-10	Gravelly Sand (SP)	0	Very Low

Sand Equivalent

Four representative soil samples were tested in accordance with the ASTM Standard D2419 test method to determine the sand equivalent. The test results are presented in the following table.

Table No. B-2, Sand Equivalent Test Results

Boring No. / Location	Depth (feet)	Soil Description	Sand Equivalent
BH-03/Tank	5-10	Gravelly Sand (SP)	46
BH-04/Pipeline	0-5	Gravelly Sand (SP)	30
BH-05/Pipeline	7-10	Gravelly Sand (SP)	63
BH-08/Pipeline	0-5	Gravelly Sand (SP)	54

Soil Corrosivity

Four representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of the tests were to determine the corrosion potential of site soils when placed in contact with common construction materials. The tests were performed by HDR, Inc. (Claremont, CA) in accordance to California Tests 643, 422 and 417. Test results are presented in the following table.

Table No. B-3, Summary of Soil Corrosivity Test Results

Boring No./ Location	Depth (feet)	pH	Soluble Sulfates (CA 417) (% by weight)	Soluble Chlorides (CA 422) (ppm)	Min. Resistivity (CA 643) (Ohm-cm)
BH-02/Tank	0-5	8.0	0.0008	2.6	12,000
BH-03/Tank	5-10	7.5	0.002	6.6	8,000
BH-04/Pipeline	10-15	7.4	0.0001	2.7	22,000
BH-07/Pipeline	5-10	6.8	0.004	35.0	4,836

Collapse

To evaluate the moisture sensitivity (collapse/swell potential) of the encountered soils, two collapse test was performed in accordance with the ASTM Standard D4546 laboratory procedure. The sample was loaded to approximately 2 kips per square foot (ksf), allowed to stabilize under load, and then submerged. The test results including the are presented in the following table.

Table No. B-4, Collapse Test Results

Boring No./ Location	Depth (feet)	Soil Classification	Percent Swell + Percent Collapse -	Collapse Potential
BH-02/Tank	5.0-6.5	Gravelly Sand (SP)	-1.7	Slight
BH-04/Pipeline	5.0-6.5	Gravelly Sand (SP)	-2.4	Moderate

Grain-Size Analyses

To assist in classification of soils, mechanical grain-size analyses were performed on four select samples in accordance with the ASTM Standard C136 test method. Grain-size curves are shown in Drawing No. B-1, *Grain Size Distribution Results*.

Maximum Density and Optimum Moisture Content

Laboratory maximum dry density-optimum moisture content relationship tests were performed on two representative bulk samples. The tests were conducted in accordance with the ASTM Standard D1557 test method. The test result is presented in Drawing No. B-2, *Moisture-Density Relationship Result,* and are summarized in the following table.

Table No B-5, Summary of Moisture-Density Relationship Result

Boring No./ Location	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Density (lb/cft)
*BH-02/Tank	0-5	Gravelly Sand (SP), Yellowish Brown	7.0	138.0
*BH-07/Pipeline	5-10	Gravelly Sand (SP), Brown	6.7	136.0

(*Rock correction)

Direct Shear

Three direct shear tests were performed on remolded samples in soaked moisture condition in accordance with ASTM D3080. Ring samples were prepared at 90 percent of maximum dry density and at optimum moisture content. For each test, three samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.02 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawings No. B-3 through B-5*, Direct Shear Test Results,* and the following table.

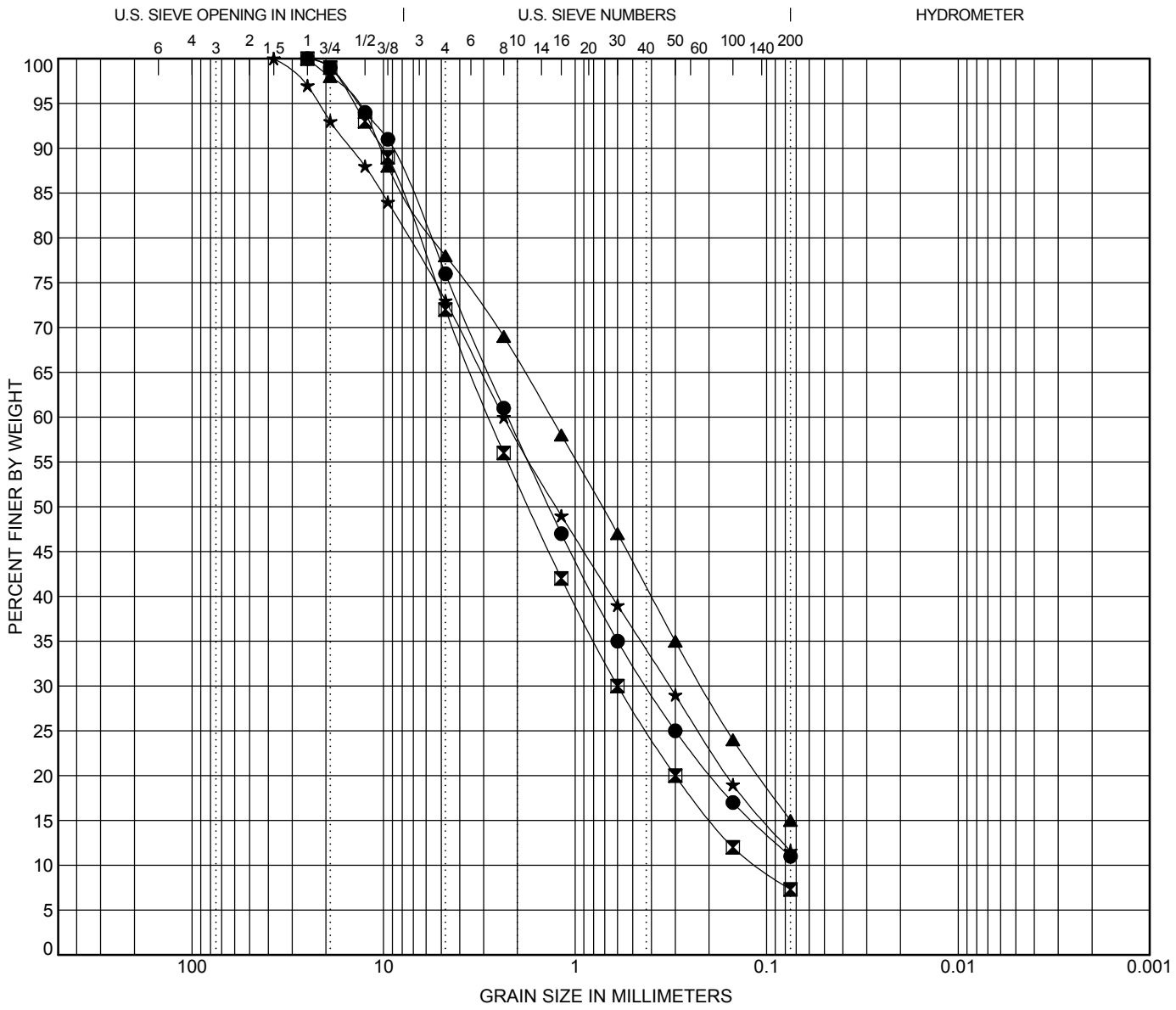
Table No. B-6, Summary of Direct Shear Test Results

Boring No./ Location	Depth (feet)	Soil Description	Peak Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
*BH-01/Tank	5.0-6.5	Gravelly Sand (SP)	33	10
*BH-03/Tank	5.0-6.5	Gravelly Sand (SP)	32	10
*BH-06/Pipeline	7.5-9.0	Gravelly Sand (SP)	33	10

(* Remolded)

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No./Location	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	**BH-01/Tank**	**0-5**	**GRAVELLY SAND (SP), LITTLE SILT**				**1.20**	**33.61**
⊠	**BH-03/Tank**	**5-10**	**GRAVELLY SAND (SP), LITTLE SILT**				**1.15**	**25.17**
▲	**BH-05/Pipeline**	**7-10**	**GRAVELLY SAND (SP), LITTLE SILT**					
★	**BH-08/Pipeline**	**0-5**	**GRAVELLY SAND (SP), LITTLE SILT**				**0.68**	**36.55**

	Boring No./Location	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-01/Tank**	**0-5**	**25**	**2.246**	**0.424**		**24.0**	**65.0**	**11.0**	
⊠	**BH-03/Tank**	**5-10**	**25**	**2.811**	**0.6**	**0.112**	**28.0**	**64.7**	**7.3**	
▲	**BH-05/Pipeline**	**7-10**	**25**	**1.338**	**0.219**		**22.0**	**63.0**	**15.0**	
★	**BH-08/Pipeline**	**0-5**	**37.5**	**2.36**	**0.322**		**27.0**	**61.4**	**11.6**	

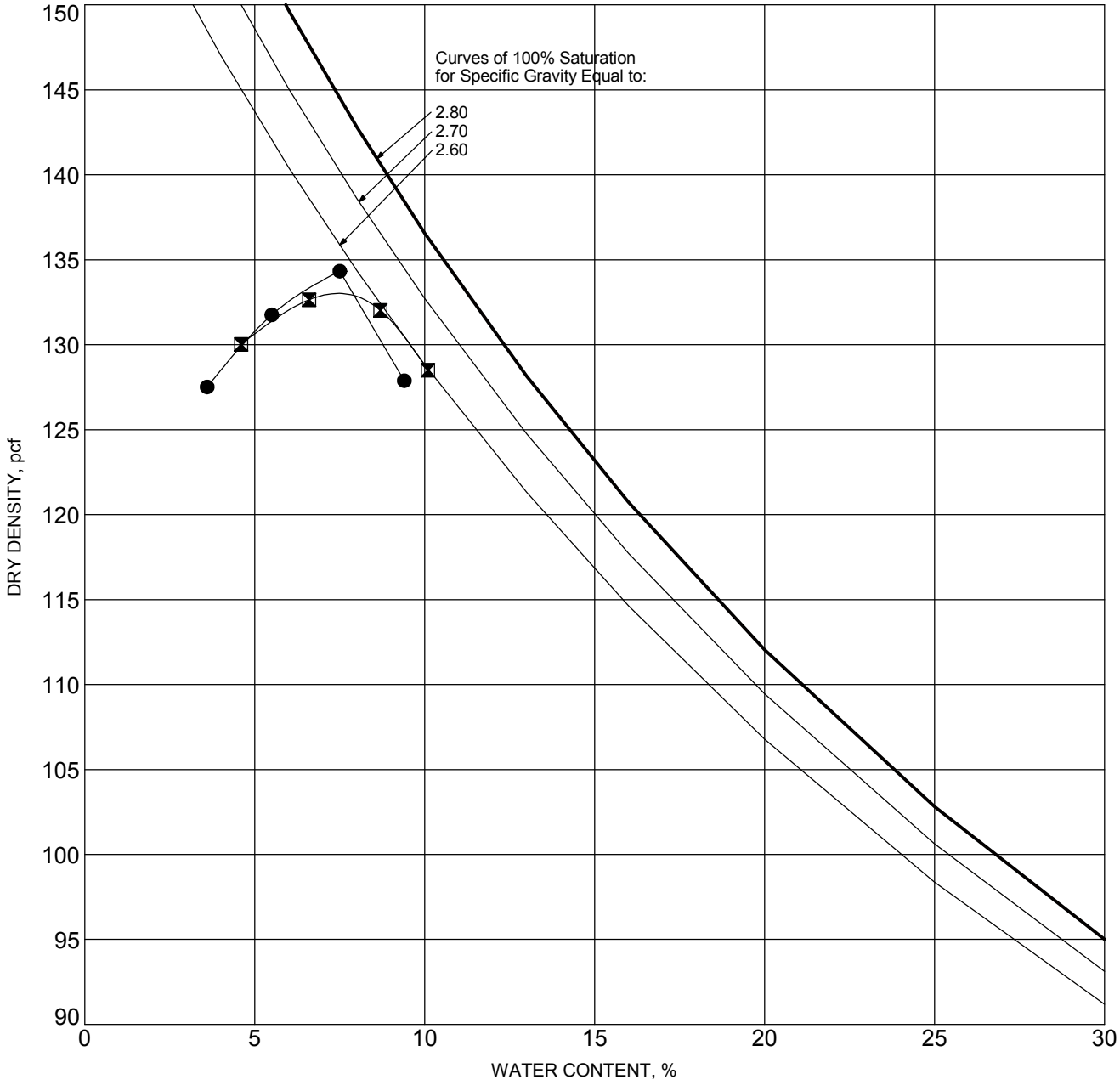
GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. **17-81-258-01**

Drawing No. **B-1**



SYMBOL	BORING NO./ LOCATION	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	***BH-02/TANK**	**0-5**	**GRAVELLY SAND (SP), YELLOWISH BROWN**	**D1557- B**	**7.0**	**138.0**
⊠	***BH-07/PIPELINE**	**5-10**	**GRAVELLY SAND (SP), BROWN**	**D1557- B**	**6.7**	**136.0**

(* = ROCK CORRECTION)

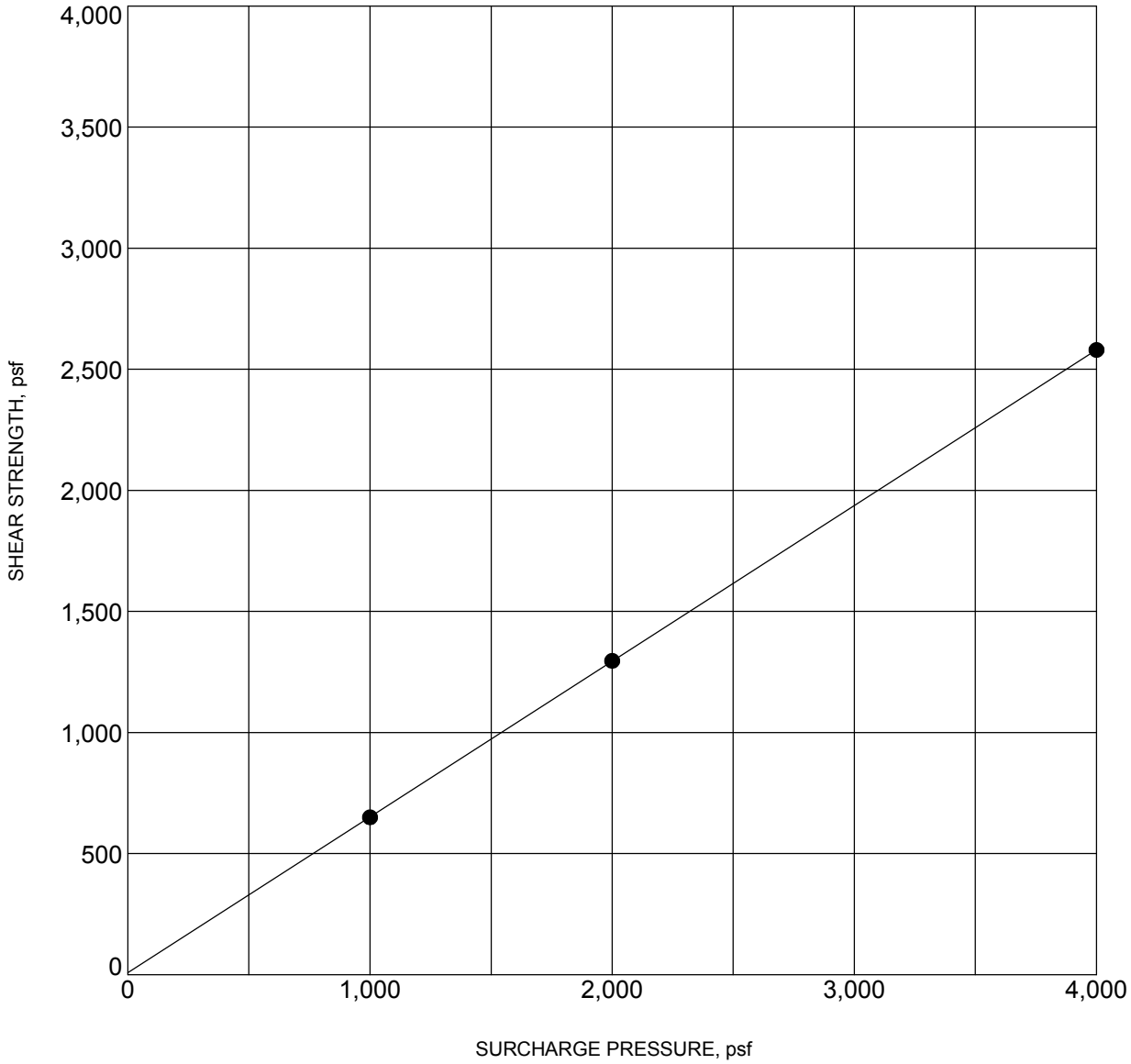
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. **17-81-258-01**

Drawing No. **B-2**



BORING NO./LOCATION	:	***BH-01/TANK**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**GRAVELLY SAND (SP), LITTLE SILT**			
COHESION (psf)	:	**10**	FRICTION ANGLE (degrees):		**33**
MOISTURE CONTENT (%)	:	**2.5**	DRY DENSITY (pcf)	:	**121.2**

*** Remolded**

NOTE: Ultimate Strength.

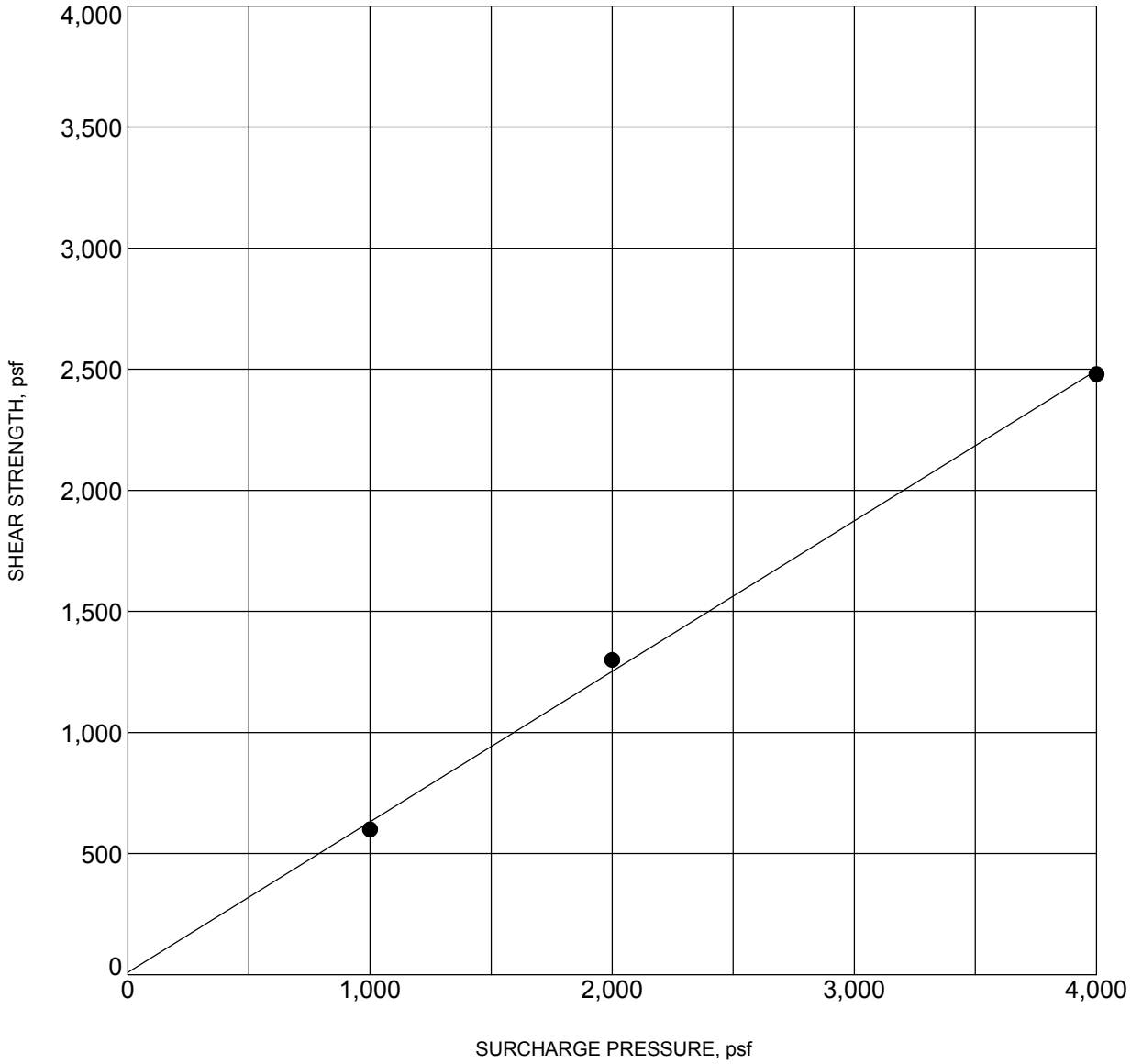
DIRECT SHEAR TEST RESULTS

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. **17-81-258-01**

Drawing No. **B-3**



BORING NO./LOCATION	:	***BH-03/TANK**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**GRAVELLY SAND (SP), LITTLE SILT**			
COHESION (psf)	:	**10**	FRICTION ANGLE (degrees):		**32**
MOISTURE CONTENT (%)	:	**1.8**	DRY DENSITY (pcf)	:	**114.0**

***Remolded**

NOTE: Ultimate Strength.

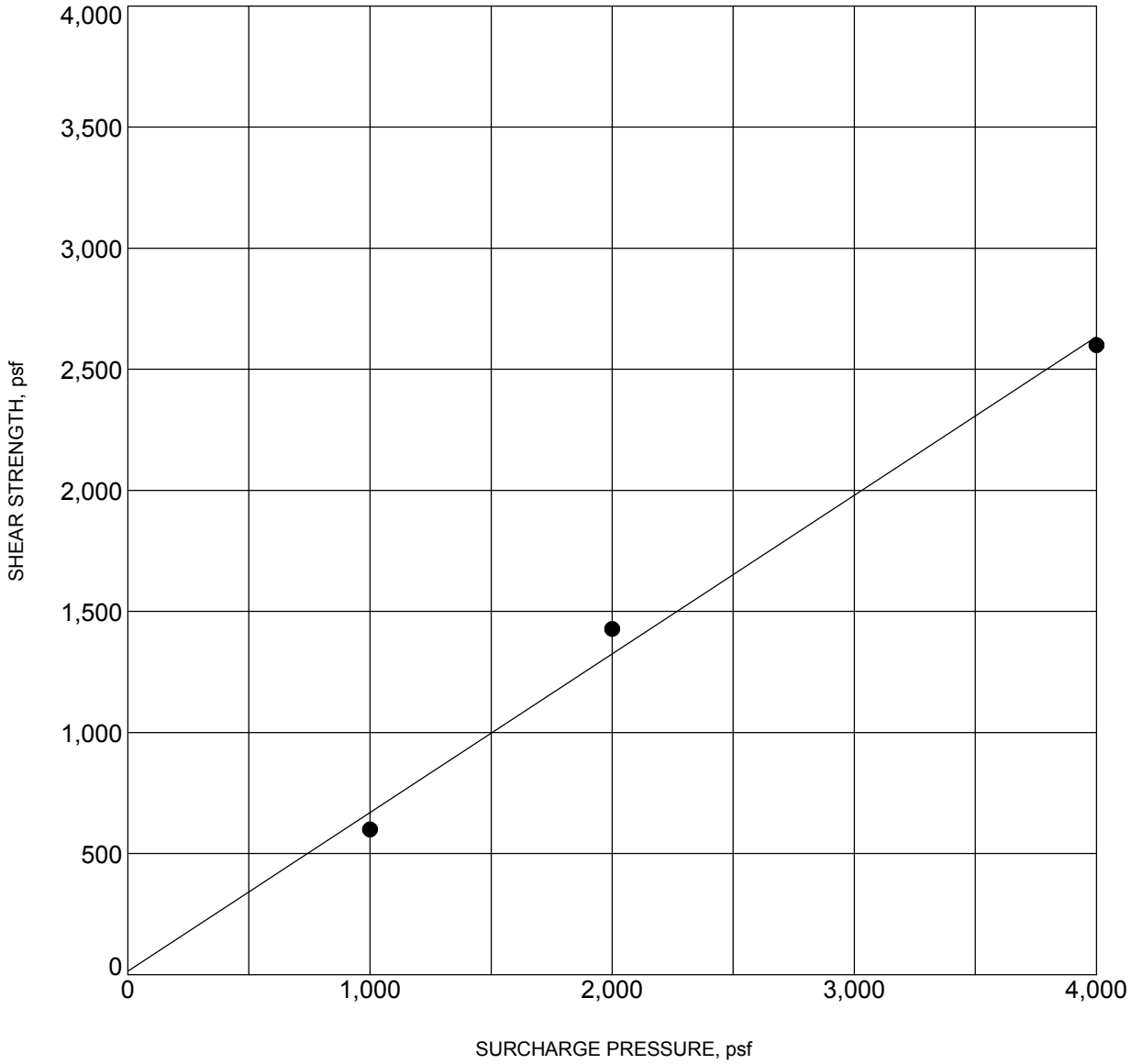
DIRECT SHEAR TEST RESULTS

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. **17-81-258-01**

Drawing No. **B-4**



BORING NO./LOCATION	:	***BH-06/PIPELINE**	DEPTH (ft)	:	**7.5-9.0**
DESCRIPTION	:	**GRAVELLY SAND (SP)**			
COHESION (psf)	:	**10**	FRICTION ANGLE (degrees):		**33**
MOISTURE CONTENT (%)	:	**1.6**	DRY DENSITY (pcf)	:	**122.2**

***Remolded**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Noble Water Storage Tank No. 2 and Transmission Pipeline
Community of Cherry Valley, Riverside County, California
For: Cozad and Fox, Inc.

Project No. **17-81-258-01**

Drawing No. **B-5**

Appendix C

Liquefaction and Settlement Analyses

APPENDIX C

LIQUEFACTION AND SETTLEMENT ANALYSES

The subsurface data obtained from the two borings (BH-02 and BH-03) were used to evaluate liquefaction and settlement due to potential densification of relatively loose sediments subjected to ground shaking during earthquakes.

The dynamic analysis was performed using Liquefy Pro (Civiltech, 2012). An earthquake magnitude of M7.0 and a peak ground acceleration (PGA) of 0.99g, where g is the acceleration due to gravity, were selected for this analysis. The magnitude and PGA were based on the site specific seismic analysis presented in Section 7.3, *Site Specific Seismic Analysis*. Analysis was performed for each boring considering groundwater condition (deeper than 50 feet bgs) with a factor of safety 1.3.

The results of our analyses are presented on Plates C-1 and C-2, and summarized in the following table.

Table C-1, Estimated Dynamic Settlement

Location	Groundwater Conditions (feet bgs)	Dry Seismic Settlement (inches)	Liquefaction (inches)
BH-02	>50	3.89	Negligible
BH-03		3.09	Negligible

Based on our analysis, the tank site has the potential for up to 3.9 inches of dry seismic settlement.

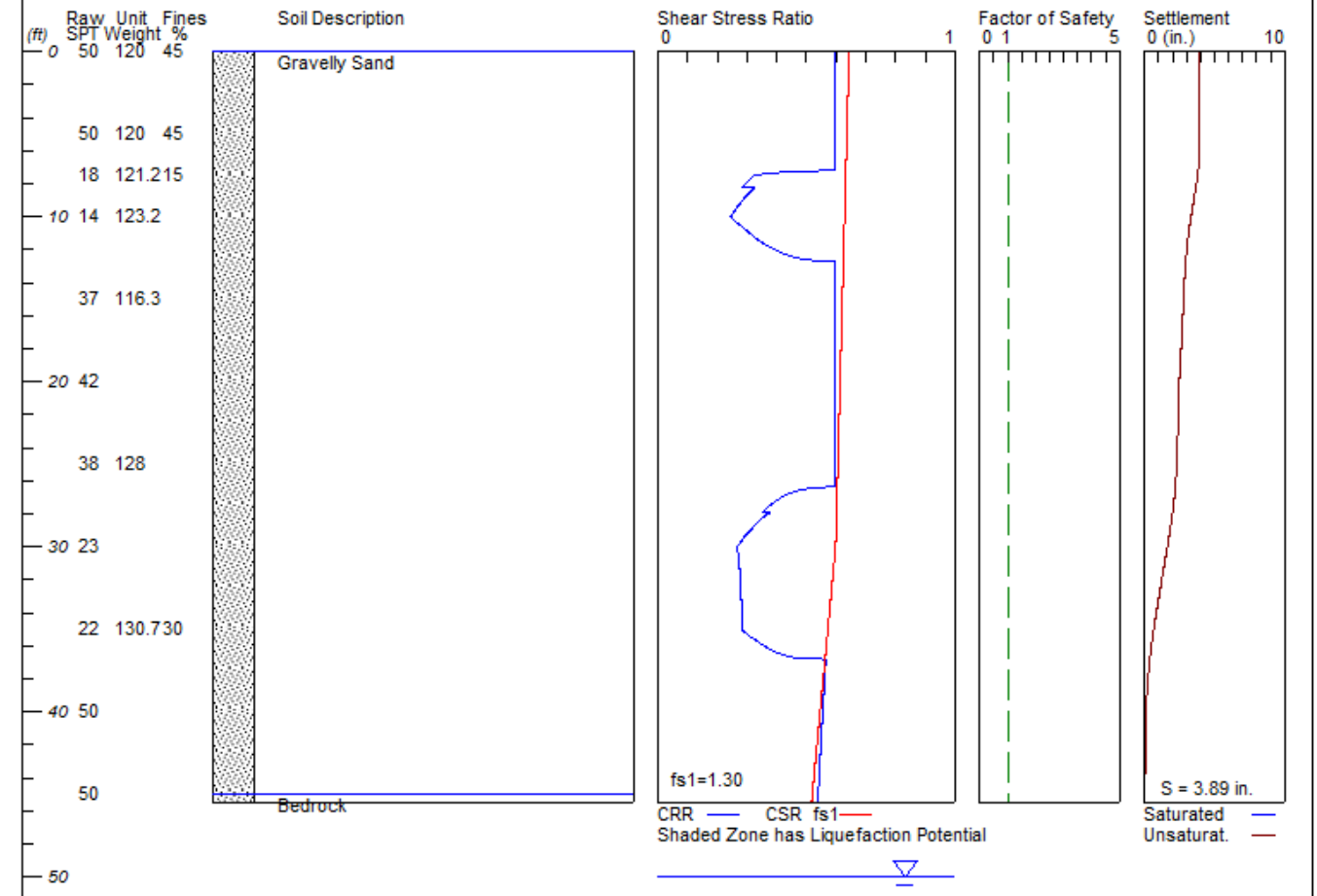
BH-02 and BH-03 were approximately 60 feet apart. The estimated total dynamic settlements in the borings are 3.89 and 3.09 inches. The difference between these estimated settlements is 0.8 inches. Based on these values, the estimated dynamic differential settlement is up to 0.6 inches over a horizontal distance of 40 feet.

DYNAMIC SETTLEMENT

Noble Storage Tank No. 2 and Transmission Pipeline

Hole No.=BH-02 Water Depth=50 ft Surface Elev.=3039

Magnitude=7
Acceleration=0.99g



CivilTech Corporation

Dry Seismic Settlement

Plate C-1

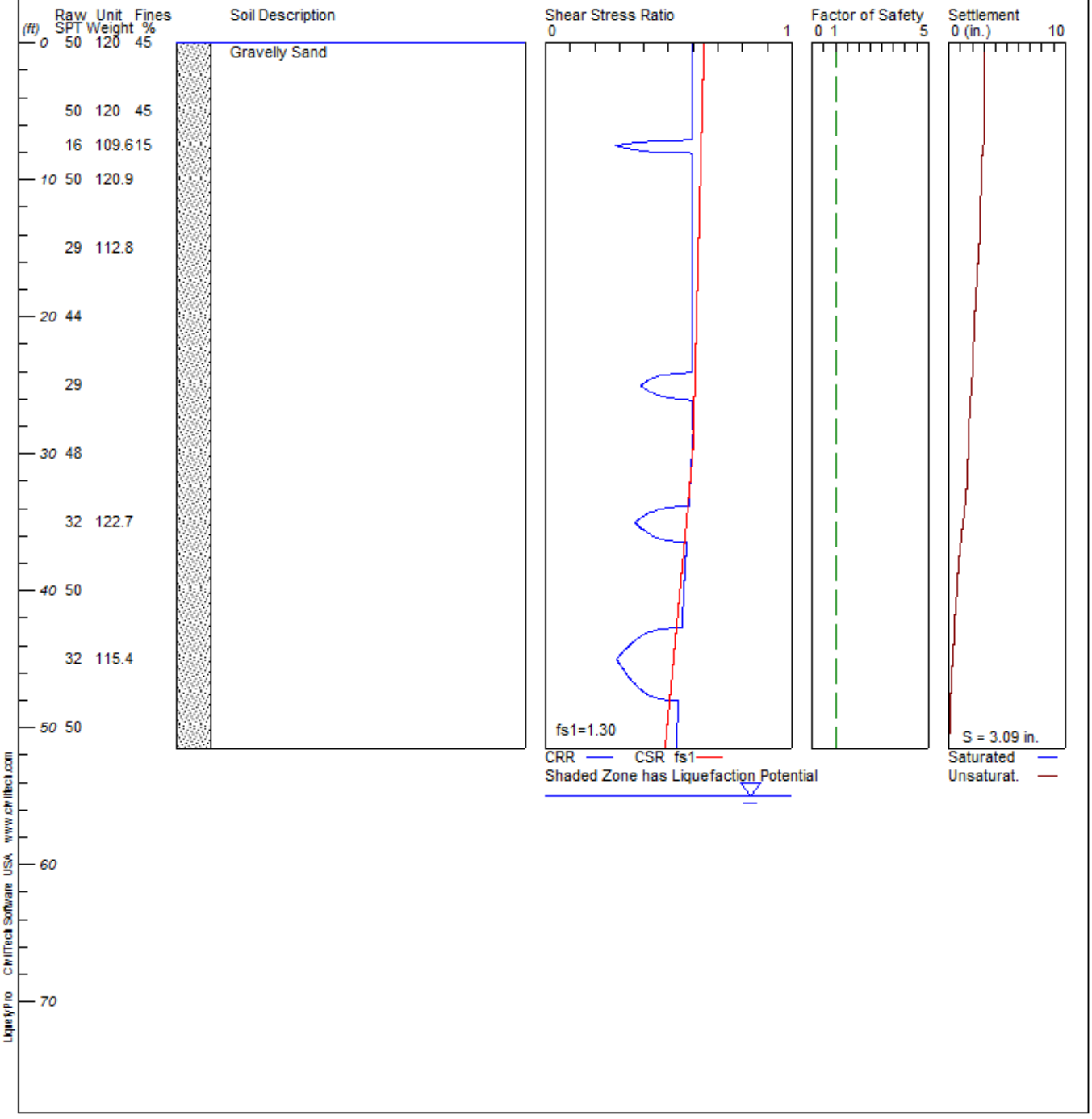
Converse Project No. 17-81-258-01

DYNAMIC SETTLEMENT

Noble Storage Tank No. 2 and Transmission Pipeline

Hole No.=BH-03 Water Depth=55 ft Surface Elev.=3041

Magnitude=7
Acceleration=0.99g



CivilTech Corporation

Dry Seismic Settlement

Plate C-2

Converse Project No. 17-81-258-01

Appendix D

Utility Trench Backfill

APPROVED BY:

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

DATE: 05/01/07

REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
8-77	12-97	1				4			
4-90		2				5			
11-95		3				6			

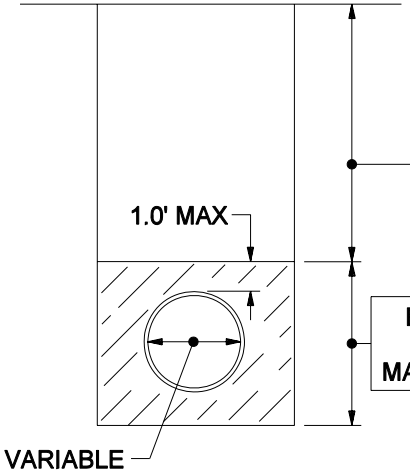
REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

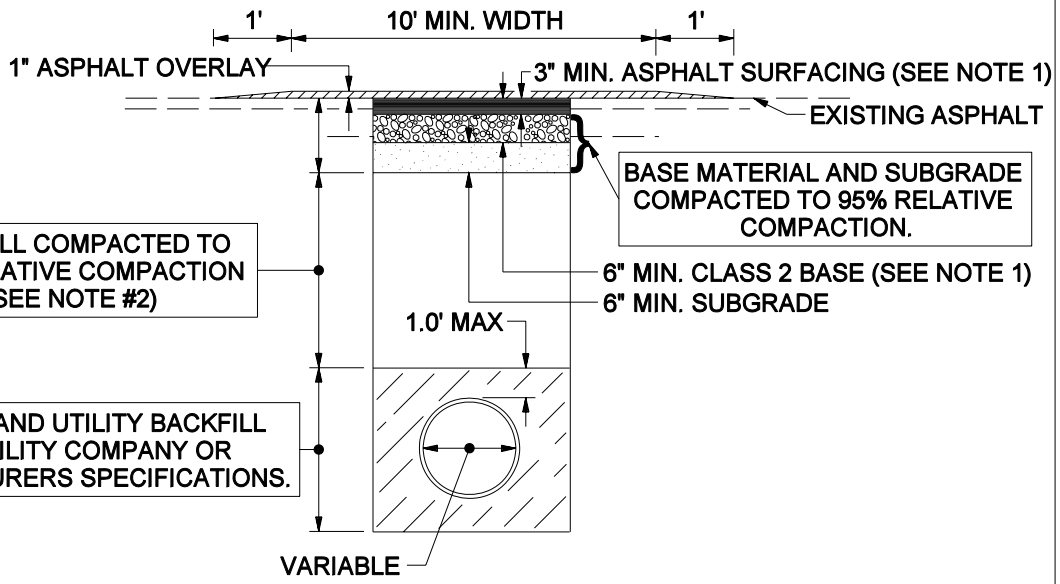
UTILITY TRENCH BACKFILL

STANDARD NO. 818

NON-ASPHALT SURFACED AREAS CASE 1



ASPHALT SURFACED STREETS WITH OVERLAY PARALLEL INSTALLATION CASE 2

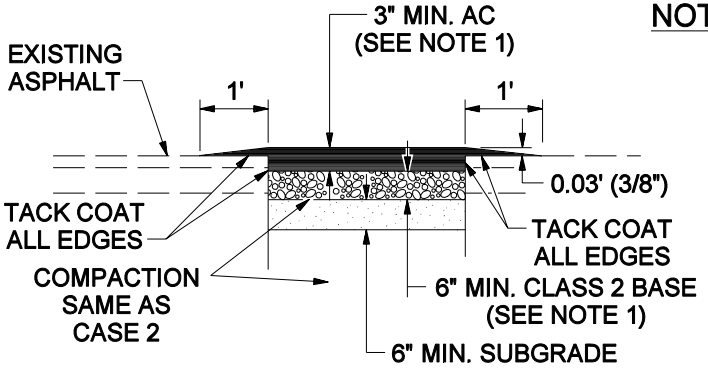


NOT TO SCALE

NOTES:

1. REPLACE STRUCTURAL SECTION AS FOLLOWS:
   SURFACING: EXISTING THICKNESS; OR 3" MIN. A.C., TYPE B.
   BASE: CLASS 2 A.B. IN SAME THICKNESS AS EXISTING BASE MATERIAL, 6" MIN. AS DIRECTED BY THE INSPECTOR.
2. MAXIMUM LIFT THICKNESS IS 8 INCHES; MAXIMUM LIFT THICKNESS WHEN PONDING AND JETTING IS 4 FEET.
3. WHEN A FIRM FOUNDATION IS NOT ENCOUNTERED, DUE TO SOFT, SPONGY OR OTHER UNSUITABLE MATERIAL, SUCH MATERIAL SHALL BE REMOVED TO THE LIMITS DIRECTED BY THE DIRECTOR OF TRANSPORTATION OR AFFECTED UTILITY COMPANY AND THE RESULTING EXCAVATION BACKFILLED WITH PIPE BEDDING MATERIAL.

ASPHALT SURFACED STREET WITHOUT OVERLAY PERPENDICULAR INSTALLATION CASE 3



Appendix E

Double Ring Infiltration Testing

APPENDIX E

DOUBLE RING INFILTROMETER TESTING

Double-ring infiltrometer testing was conducted at two locations at the site. Testing was conducted on the surface in general accordance with ASTM Standard D-3385, *Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometers*, dated 2003. The ASTM D-3385 test method is permitted in the Riverside County- Low Impact Development BMP Design Handbook (Riverside County, 2011).

The double-ring infiltrometer method consists of driving two open cylinders, one inside the other, into the ground, partially filling the rings with water, and then maintaining the water at a constant level for a minimum of six hours. The volume of water added to the inner ring to maintain a constant water level is the measure of the volume of water that infiltrates the soil.

The volume infiltrated during timed intervals is converted to an incremental infiltration velocity, usually expressed in centimeters per hour (cm/hr) or inches per hour (in/hr). The maximum steady state or average incremental infiltration velocity, depending on the purpose/application of the test is equivalent to the infiltration rate.

Since the average incremental infiltration velocity of the inner ring and annular spaced differed over the course of testing; only the rate of the inner rings is used, per ASTM Standard D3385. Test results are provided in Table No. E-1, *Double Ring Infiltrometer Test Results.*

This test method is particularly applicable to relatively uniform fine-grained soils, with an absence of very plastic (fat) clays and gravel-size particles and with moderate to low resistance to ring penetration. The infiltration rate depends on soil structure, soil layering, condition of the soil structure, and degree of saturation of the soil. The estimated infiltration rates at the test locations are presented in the following table.

Table No. E-1, Double Ring Infiltrometer Test Results

Test No.	Depth of Test Pit	Recommended Design Infiltration Rate (inches/hr)	Factor of Safety (FOS)	Recommended Design Infiltration Rate (inches/hr) with FOS	Average Design Infiltration Rate for Field
DR-01	Ground Surface	2.49	3	0.83	0.85
DR-02	Ground Surface	2.62		0.87	
DR-01	Ground Surface	2.49	2	1.25	1.28
DR-02	Ground Surface	2.62		1.31	

The measured tests data are shown on Plates No. 1 and 3, *Estimated Infiltration Rate from Double-Ring Infiltrometer Test Data* and Plates No. 2 and 4, *Infiltration Rate Versus Time* in Appendix E *Double Ring Infiltrometer Testing.*

Based on the calculated infiltration rate from double ring infiltrometer test, the design infiltration rate for the site is 0.85 in/hr and 1.28 in/hr for a factor of safety of 3 and 2, respectively.

Estimated Infiltration Rate from Double-Ring Infiltrometer Data

Project Name	Noble Tank
Project Number	17-81-258-03
Test Number	DR-01
Test Location	NE Portion of site
Personnel	Catherine Nelson
Test Date	8/21/2019

Constants	Area (cm^2)	Depth of Liquid (in)	Liquid Container Number	Marriotte Tube Volume (cm^3)
Inner Ring	707.0		1	78.54
Annular Space	2106.0		2	176.7
Liquid level maintained using: ( ) Flow Valve ( ) Float Valve (X) Mariotte Tubes				
Penetration Depth of Outer Ring:			3	

Reading Number	Time (min)	(cm/hr)		in/hr	
		inner	annular	inner	annular
0	0	0	0	0	0
1	15	26.66	20.14	10.50	7.93
2	30	25.55	13.59	10.06	5.35
3	45	26.66	14.10	10.50	5.55
4	60	26.66	12.59	10.50	4.95
5	90	8.55	10.07	3.37	3.96
6	120	13.33	8.39	5.25	3.30
7	180	6.67	5.03	2.62	1.98
8	240	6.33	4.53	2.49	1.78
9	300	6.67	5.03	2.62	1.98
10	360	6.33	4.28	2.49	1.68

Recommended Design Infiltration Rate (inches/hr)	2.49
Recommended Design Infiltration Rate with factor of safety of 3 (inches/hr)	0.83
Recommended Design Infiltration Rate with factor of safety of 2 (inches/hr)	1.25

Project Name	Noble Tank
Project Number	17-81-258-03
Test Number	DR-01
Test Location	NE Portion of site
Personnel	Catherine Nelson
Test Date	8/21/2019

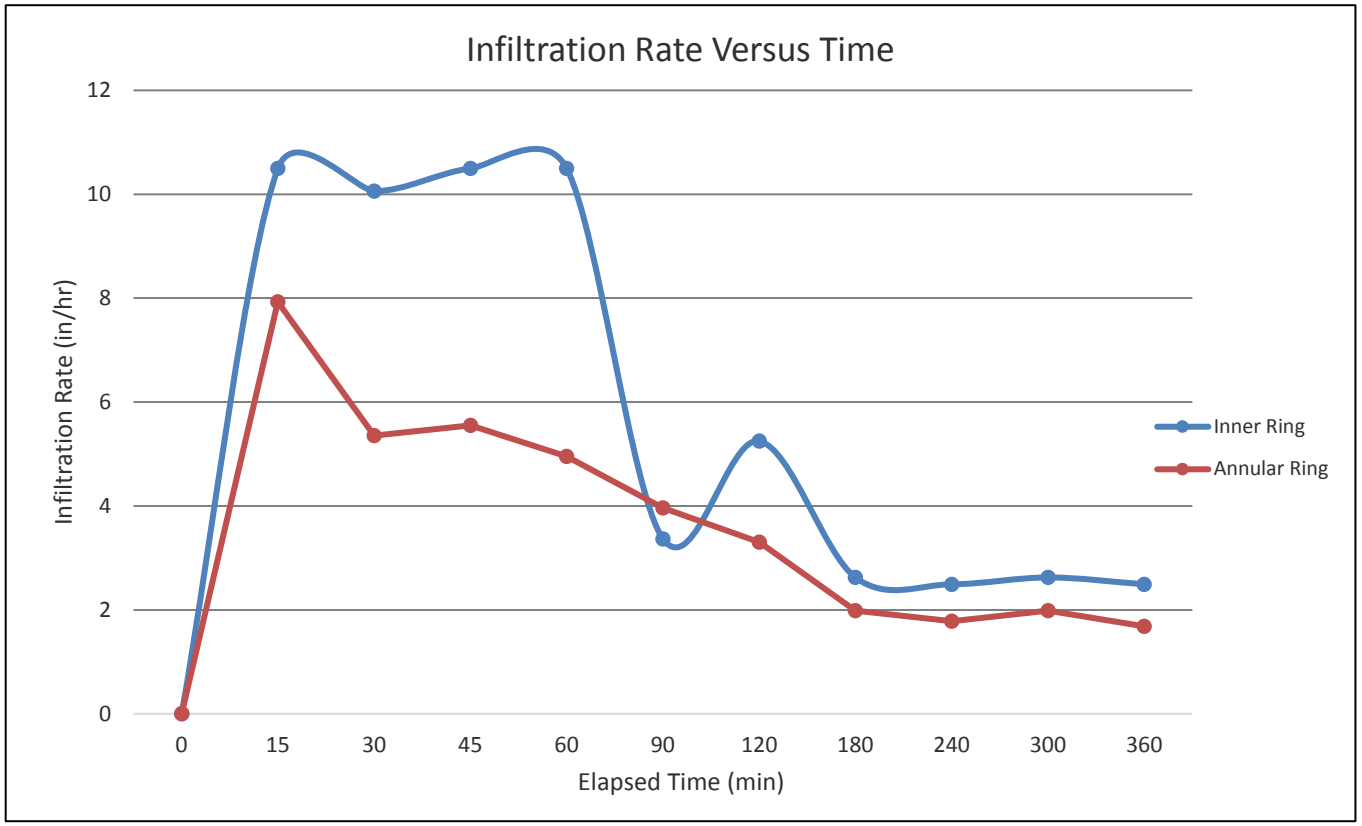


Plate 2

Estimated Infiltration Rate from Double-Ring Infiltrometer Data

Project Name	Noble Tank
Project Number	17-81-258-03
Test Number	DR-02
Test Location	SW Portion of site
Personnel	Catherine Nelson
Test Date	8/27/2019

Constants	Area (cm^2)	Depth of Liquid (in)	Liquid Container Number	Marriotte Tube Volume (cm^3)
Inner Ring	707.0		1	78.54
Annular Space	2106.0		2	176.7
Liquid level maintained using: ( ) Flow Valve ( ) Float Valve (X) Mariotte Tubes				
Penetration Depth of Outer Ring:			3	

Reading Number	Time (min)	(cm/hr)		in/hr	
		inner	annular	inner	annular
0	0	0	0	0	0
1	15	10.89	1.34	4.29	0.53
2	30	10.13	6.88	3.99	2.71
3	45	8.13	7.08	3.20	2.79
4	60	7.24	4.90	2.85	1.93
5	90	8.40	7.50	3.31	2.95
6	120	9.26	5.39	3.65	2.12
7	180	6.67	5.03	2.62	1.98
8	240	6.67	4.72	2.62	1.86
9	300	6.67	4.76	2.62	1.87
10	360	6.67	4.77	2.62	1.88

Recommended Design Infiltration Rate (inches/hr)	2.62
Recommended Design Infiltration Rate with factor of safety of 3 (inches/hr)	0.87
Recommended Design Infiltration Rate with factor of safety of 2 (inches/hr)	1.31

Project Name	Noble Tank
Project Number	17-81-258-03
Test Number	DR-02
Test Location	SW Portion of site
Personnel	Catherine Nelson
Test Date	8/27/2019

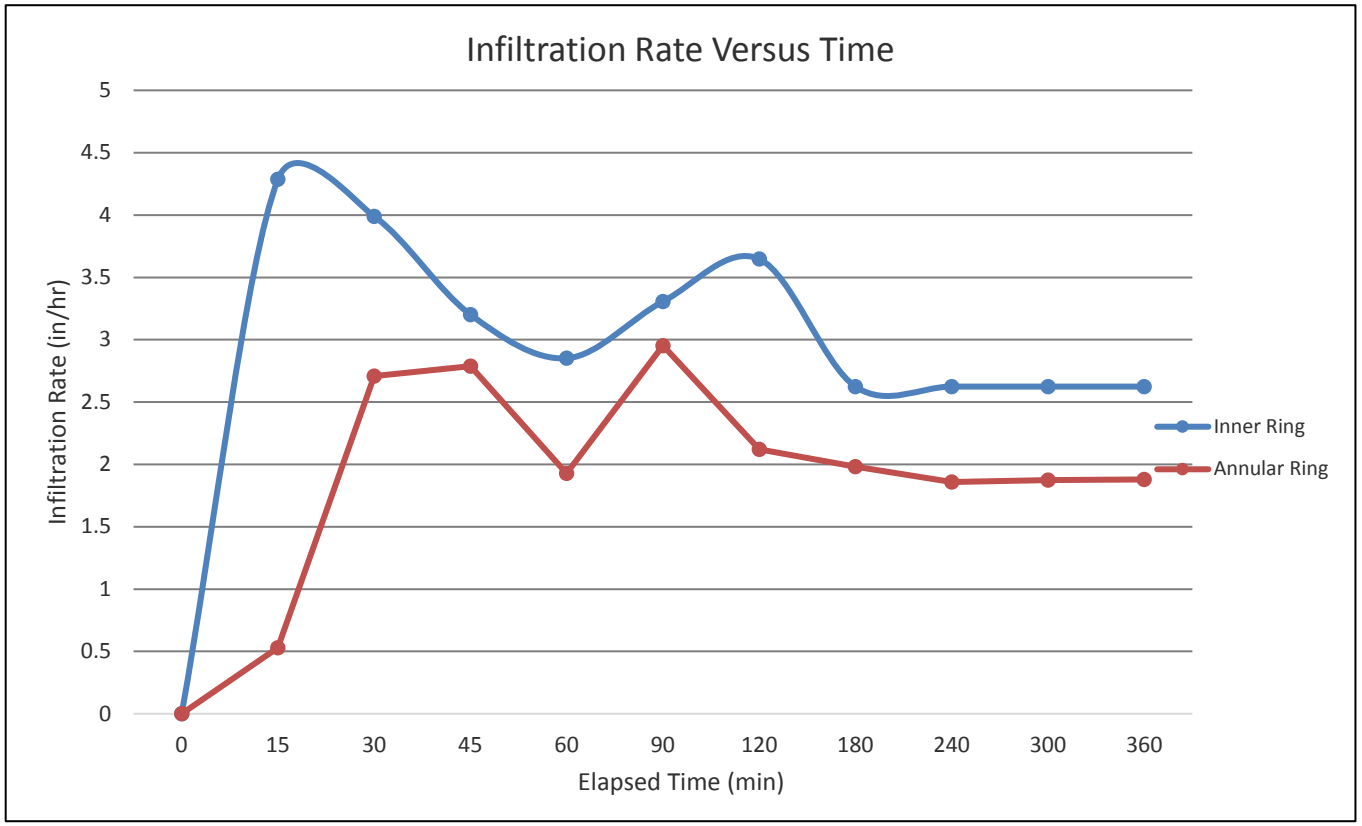


Plate 4