ALBERT A. WEBB ASSOCIATES

# INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

Benedict Reservoir and Armstrong Booster Station Project
District Project No. C195057

Prepared for

jurupa COMMUNITY SERVICES DISTRICT

August 2019

www.webbassociates.com

# INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

## Benedict Reservoir and Armstrong Booster Station Project
## District Project No. C195057

*Prepared for:*
**Jurupa Community Services District**
**Engineering Department**

*Prepared by:*
**Albert A. Webb Associates**
**3788 McCray Street**
**Riverside, California 92506**

**August 2019**

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## ACRONYMNS

| | |
|---|---|
| AB 52 | Assembly Bill 52 |
| ALUC | Riverside County Airport Land Use Commission |
| AQMP | Air Quality Management Plan |
| AWWA | American Water Works Association Standards |
| Basin | South Coast Air Basin |
| BMPs | Best Management Practices |
| CalEEMod | California Emissions Estimator Model |
| Cal-OSHA | California Occupational Safety and Health Administration |
| Caltrans | California Department of Transportation |
| CAGN | Coastal California Gnatcatcher |
| CARB | California Air Resources Board |
| CCR | California Code of Regulations |
| CDFW | California Department of Fish and Wildlife |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| $CH_4$ | Methane |
| CNDDB | California Natural Diversity Database |
| CNPS | California Native Plant Society |
| CO | Carbon monoxide |
| $CO_2$ | Carbon dioxide |
| $CO_2E$ | Carbon dioxide equivalent |
| CRPR | California Rare Plant Rank |
| Cu yd | Cubic yards |
| DOC | California Department of Conservation |
| DTSC | Department of Toxic Substances Control |
| EIC | Eastern Information System |
| FEMA | Federal Emergency Management Agency |
| GHG | Greenhouse Gas |
| GP | General Plan |
| GPM | Gallons per Minute |
| HGL | Hydraulic grade line |
| HP | Horse Power |
| I-15 | Interstate 15 |

| | |
|---|---|
| JCSD | Jurupa Community Services District |
| JVGP | City of Jurupa Valley General Plan 2017 |
| JVGP DEIR | City of Jurupa Valley General Plan 2017 Draft Environmental Impact Report |
| JVGP FPEIR | City of Jurupa Valley General Plan 2017 Final Environmental Impact Report |
| Lbs/day | Pounds per day |
| LF | Linear feet |
| LST | Localized significance threshold |
| MBNI | Morongo Band of Mission Indians |
| MGD | Million gallons per day |
| MSHCP | Western Riverside County Multiple-Species Habitat Conservation Plan |
| $MTCO_2E/yr$ | Metric tonnes per year of carbon dioxide equivalents |
| MT/yr | Metric tons per year |
| $N_2O$ | Nitrous oxide |
| $NO_x$ | Oxides of nitrogen |
| NPDES | National Pollution Discharge Elimination System |
| PRC | Public Resource Code |
| PM-2.5 | Particulate matter less than 2.5 microns in size |
| PM-10 | Particulate matter less than 10 microns in size |
| RCHCA | Riverside County Habitat Conservation Agency |
| ROW | Right-of-way |
| RWQCB | Regional Water Quality Control Board |
| RWQCP | Regional Water Quality Control Plant |
| SCAQMD | South Coast Air Quality Management District |
| SCCIC | South Central Coastal Information Center |
| $SO_x$ | Sulfur oxides |
| SR-60 | State Route 60 |
| SR-91 | State Route 91 |
| SCAQMD | South Coast Air Quality Management District |
| SMBMI | San Manuel Band of Mission Indians |
| SRA | Source receptor area |
| SWPPP | Storm Water Pollution Prevention Plan |
| USFWS | United States Fish and Wildlife Service |
| VOC | Volatile organic compound |

## INTRODUCTION

In accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000–21177), this Initial Study has been prepared to determine potentially significant impacts upon the environment resulting from the proposed Benedict Reservoir and Armstrong Booster Station Project (hereinafter refer to as “proposed Project” or “Project”). In accordance with *CEQA Guidelines* Section 15063, this Initial Study is a preliminary analysis prepared by Jurupa Community Services District (JCSD), as Lead Agency, to inform the JCSD Board of Directors, affected agencies, and the public of potential environmental impacts associated with the implementation of the proposed Project.

## BACKGROUND

Jurupa Community Services District (JCSD) has two existing welded steel potable water storage reservoirs for the 1200 Pressure Zone at the Benedict Reservoir site with water storage capacities of 1.0 million gallons (MG) and 0.21 MG. The 1.0 MG water storage reservoir is 86-foot (ft.) in diameter with a floor elevation of 1,180 ft., and a high-water elevation of 1,203 ft. The water storage reservoirs are fed from the Armstrong Booster Station which is supplied by the 1100 Pressure Zone. This pump station has two 550 gallons per minute (GPM) pumps (one is for stand-by) with an emergency stand-by generator unit.

The 1200 Pressure Zone, one of seven pressure zones in JCSD, is located in the northeast portion of JCSD. In 2016, Albert A. Webb Associates prepared a pressure zone study (2016 Study) for the 1200 Pressure Zone, to account for several recent developments not included in the 2005 Master Water Plan. The 2016 Study, which analyzed water demands, storage requirements, and pumping needs, recommended replacing the existing 0.21 MG welded steel water storage reservoir with a 0.81 MG welded steel water storage reservoir to meet the ultimate water demand. In addition, the 2016 Study recommended upsizing existing pumps at the Armstrong Booster Station to accommodate the ultimate water flow target of 1,237 GPM. The Project proposes a 1.1 MG water storage reservoir in lieu of the 0.81 MG water storage reservoir recommended in the 2016 Study to accommodate development activities that occurred subsequent to preparation of the 2016 Study and to account for future redevelopment activities within the 1200 Pressure Zone.

## PURPOSE AND NEED FOR THE PROJECT

The proposed Project will accomplish two things: increase storage capacity at the existing Benedict Reservoir site to a target capacity of 2.1 MG (1.1 MG from the new reservoir and 1.0 MG from the remaining reservoir) and increase the pumping capacity as well as the system reliability and redundancy at the Armstrong Booster Station through the addition of a new pump with a future target pumping capacity of 1,237 GPM.

## DOCUMENT PROCESS

The environmental process being undertaken as part of the Project began with the initial project and environmental research. The Initial Study/Mitigated Negative Declaration will be subject to a 30-day

public review period. During this review period, public and agency comments on the document relative to environmental issues should be addressed to:

Eddie Rhee, P.E., Engineering Manager
Jurupa Community Services District
Engineering Department
11201 Harrel Street
Jurupa Valley, California 91752
erhee@jcsd.us

Comments received during that time will be considered as part of the Project's environmental review and will be included with the environmental documents for consideration by the JCSD Board of Directors.

1. **Project Title:** Benedict Reservoir and Armstrong Booster Station Project (District Project No. C195057)

2. **Lead Agency:** Jurupa Community Services District
Engineering Department
11201 Harrel Street
Jurupa Valley, California 91752

3. **Contact Person:** Eddie Rhee, P.E., Engineering Manager
**Phone Number:** (951) 685-7434

4. **Project Location:** The proposed Project is generally located north of State Route 60 (SR-60), west of SR-91, west of Interstate15 (I-15), and south of I-10, in the City of Jurupa Valley. (See **Figure 1 – Regional Map)**. The proposed Benedict Reservoir is located at the existing reservoir site on Jurupa Mountains, north of a residential community. The proposed Armstrong Booster Station is located on the southeast corner of Armstrong Road and Karen Lane. (See **Figure 2 – Project Location**).

5. **Project Applicant/Project Sponsor's Name and Address:**

Jurupa Community Services District
Engineering Department
11201 Harrel Street
Jurupa Valley, California 91752

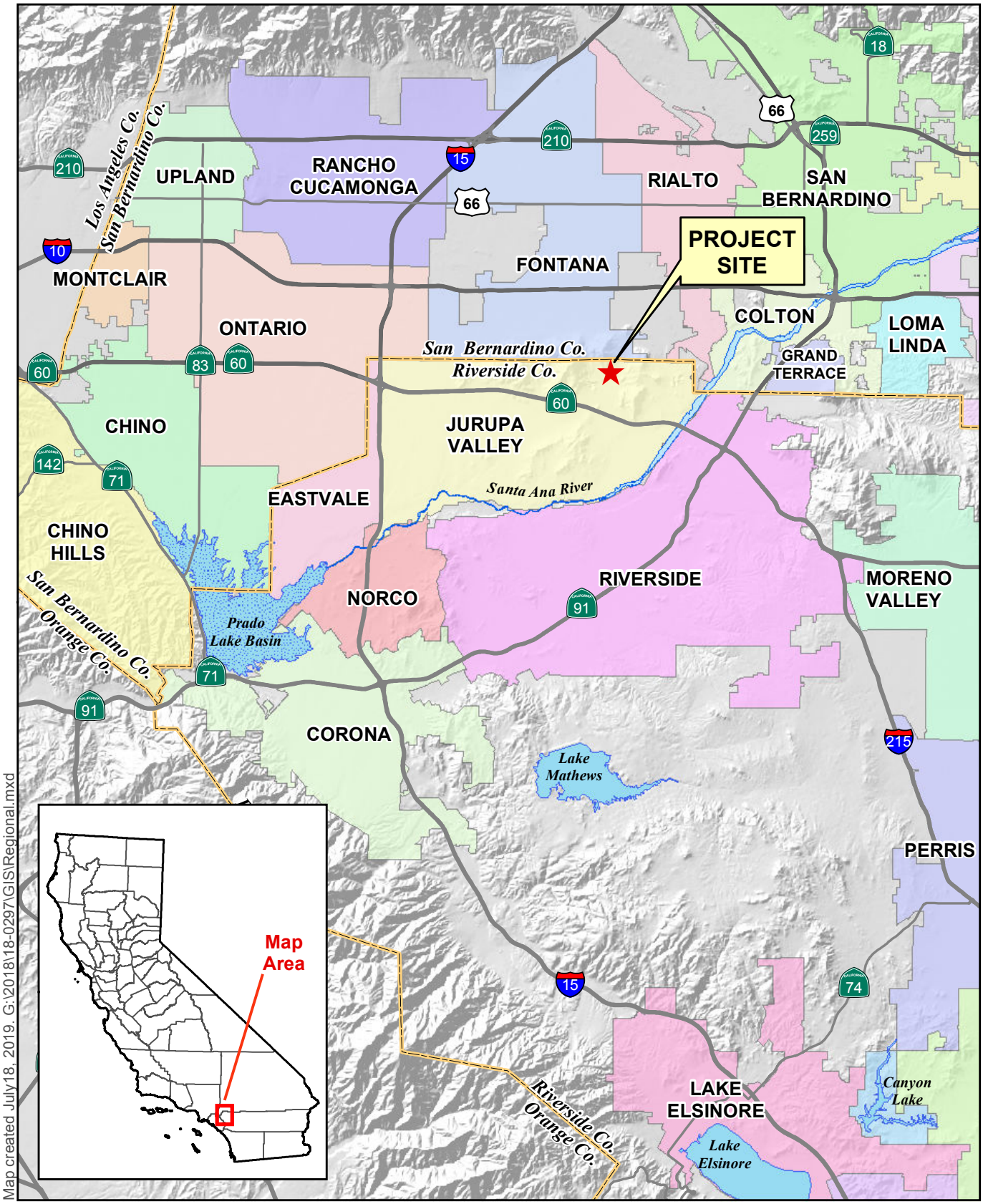


**Figure 1 – Regional Map**

Benedict Reservoir and Armstrong Booster Station

0 2 4 6 Miles

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G:\2018\18-0297\GIS\Aerial.mxd; Map created 18 Jul 2019

Sources: Riverside Co. GIS, 2019;
San Bernardino Co. GIMS, 2018 (imagery).

**Figure 2 - Project Location**

Benedict Reservoir and Armstrong Booster Station

N

0 1,000 2,000 Feet

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## 6. General Plan Designation:

The existing reservoir site has a Jurupa Valley General Plan (JVGP) land use designation of Open Space Rural (OS-RUR), and the Armstrong Booster Station site has a JVGP land use designation of Low Density Residential (LDR) – Country Neighboorhood. Both are within the Equestrian Lifestyle Protection Overlay (ELO) designation.

## 7. Zoning:

The proposed Benedict Reservoir site has a zoning deisgnation of M-H Manufacturing – Heavy, and the Armstrong Booster Station has a zoning designation of A-1 – Light Agriculture.

## 8. Description of Project:

The Project entails improvements to the Benedict Reservoir and Armstrong Booster Station, two different sites located in the City of Jurupa Valley (Jurupa Valley), as shown on **Figure 2 – Project Location**. The construction and operation of a new 1.1 MG potable water storage reservoir, associated appurtenances, realignment of the access road, and the demolition of the existing 0.21 MG potable water storage reservoir constitutes the Benedict Reservoir portion of the Project. The construction and operation of a new 550 GPM booster pump constitutes the Armstrong Booster Station portion of the Project. The proposed Project characteristics are further described below.

***Benedict Reservoir***

The Benedict Reservoir site is located within the Jurupa Mountains and sits at a higher elevation than the adjacent residential community. The site is located in the northeast portion of JCSD's boundary, in Jurupa Valley. The Benedict Reservoir site has an existing 86-ft. diameter 1.0 MG potable water storage reservoir and a 40-ft. diameter 0.21 MG reservoir. The water storage reservoirs sit on a floor elevation of 1,180 ft and have a height of 24 ft. above the finished floor elevation. The Benedict Reservoir site is mostly paved, enclosed, gated, and can be accessed from a paved road situated between two homes on Sandra Drive.

The proposed Benedict Reservoir component of the Project entails the demolition of the existing 0.21 MG potable water storage reservoir and the construction of a new 1.1 MG potable water storage reservoir in its place. This Project component will also include relocation of portions of the existing fence and access road, along with the gate, to accommodate the new water storage reservoir. Approximately 500 cubic yards (cu yd) of soil would be imported and 100 cu yd of large rocks, will be exported from the Benedict Reservoir site. An approximate 120 linear-foot (LF) retaining concrete wall along the northern portion of the new 1.1 MG reservoir, in between the reservoir and the relocated access road is proposed, as shown in **Figure 3 – Project Site Plan (Benedict Reservoir)**.

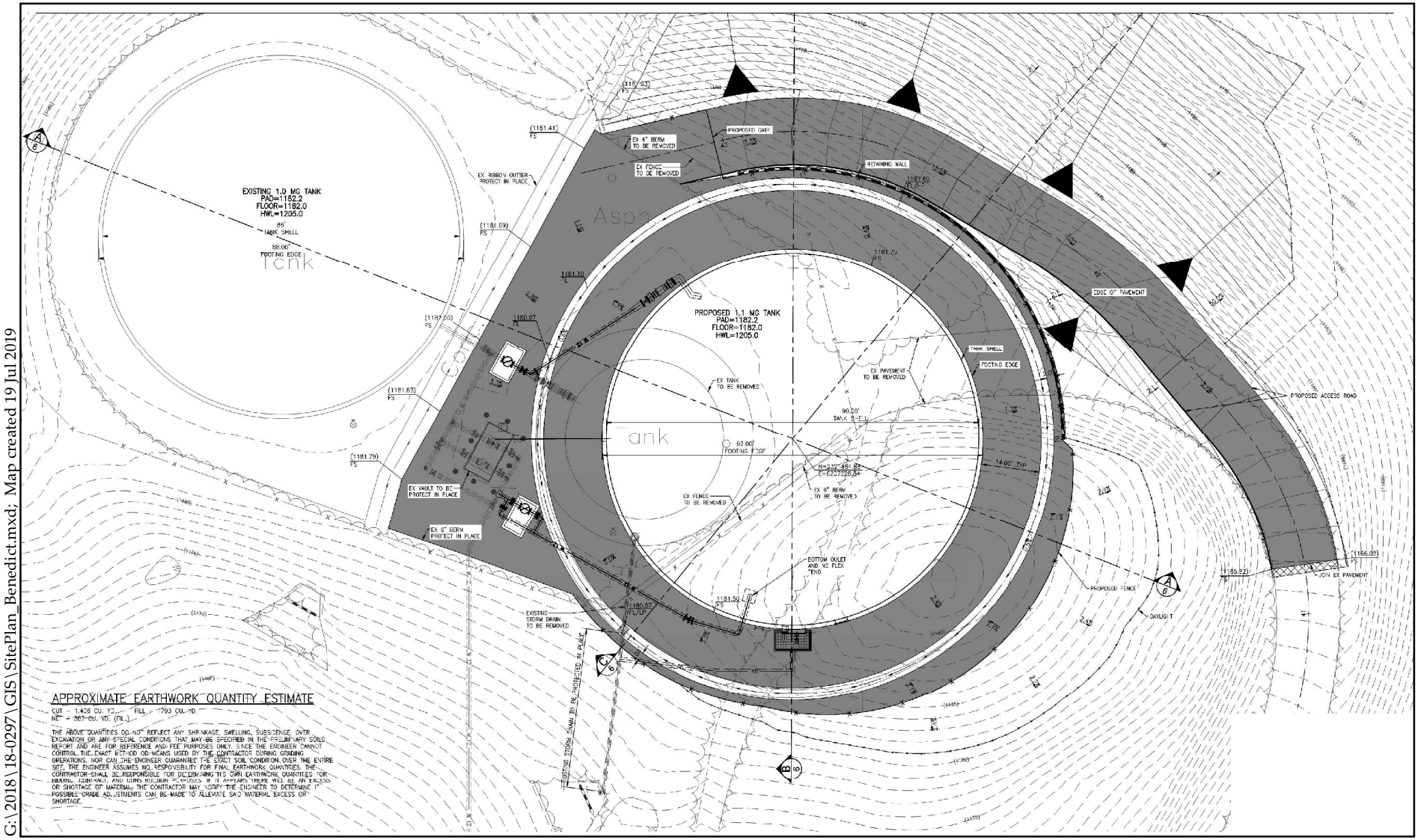


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**Figure 3 - Project Site Plan (Benedict Reservoir)**

Benedict Reservoir and Armstrong Booster Station

Not to Scale

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The new reservoir will be made of steel, and will be approximately 90 ft. in diameter with a maximum height of 23 ft. above the finished floor elevation. The reservoir will be designed in accordance with the American Water Works Association (AWWA) D100 standards, which sets guidelines for the construction of welded steel water tanks. The new water storage reservoir will have a high water elevation of 1,205 ft., similar to the remaining 1.0 MG water reservoir. The new water storage reservoir will include standard tank appurtenances such as roof vent, roof hatch and platform, ladder, minimum ring wall, inspection covers, pressure transmitter, conduits, sampling ports and cathodic protection handholes.

The existing 1.0 MG reservoir will remain operational during demolition and construction. Only minor shutdowns to the Benedict Reservoir site are necessary once the new 1.1 MG is ready to connect into the water system. The new reservoir will have an interior coating compliant with the low-VOC requirements of South Coast Air Quality Management District (SCAQMD). The exteriors of the new 1.1 MG reservoir and the remaining 1.0 MG reservoir will be coated with similar low-VOC coating design for industrial tanks. The color of the coating has been selected to blend in with the local hillside.

***Armstrong Booster Station***

The Armstrong Booster Station, located within the JCSD and Jurupa Valley's boundary, is approximately 0.65 miles southwest of the Benedict Reservoir site. The Armstrong Booster Station is adjacent to residences and is located on the corner of Armstrong Road and Karen Lane. The booster station is paved, gated, and has a roll gate along Karen Lane for access. A steel structure, which houses the existing pumps, is located in the middle of the Armstrong Booster Station site. The electrical panel that services the booster station is located on the northwestern part of the Armstrong Booster Station site. Both the steel structure and the electrical panel are visible from Armstrong Road and Karen Lane.

The Armstrong Booster Station has two existing 550 GPM 30 horsepower (HP) pumps (one for standby) enclosed in the steel structure. A third 550 GPM 30 HP pump and associated electrical equipment will be added to the station to provide redundancy and a future target pumping capacity of 1,237 GPM. To accommodate the third pump and unit piping, a canopy will be constructed off the existing steel structure on the east side, as shown in **Figure 4 – Project Site Plan (Armstrong Booster Station).** The steel structure extension will include an exhaust fan. The electrical panel has sufficient physical space to accommodate the electrical connections required for the third pump.

## 9. Surrounding Land Uses and Setting:

***Benedict Reservoir***

Land uses surrounding the Benedict Reservoir site include the Jurupa Mountains to the north and west and an established residential development to the south and east.

***Armstrong Booster Station***

Land uses surrounding the Armstrong Booster Station site include residential uses to the north, east, south, and west.

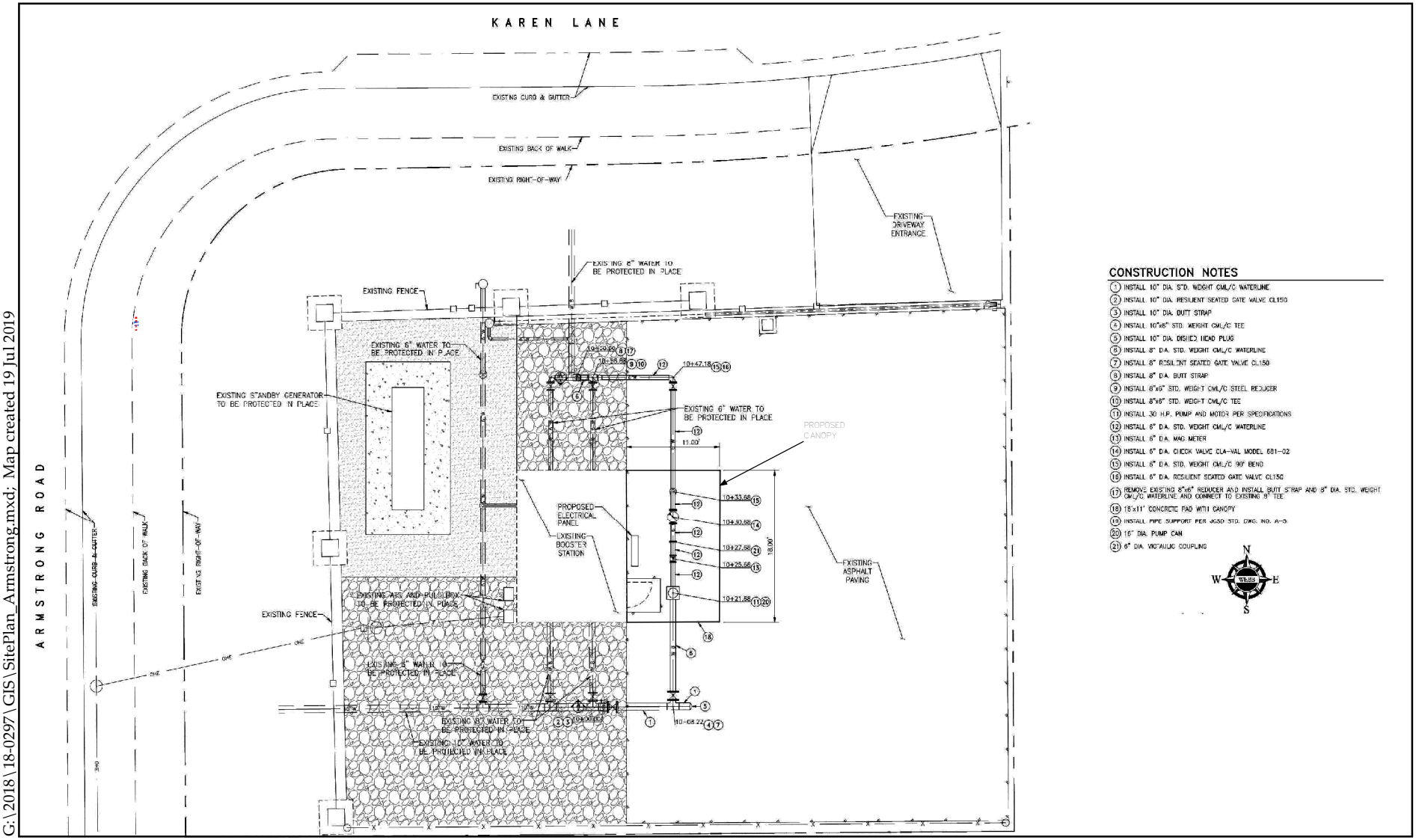


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**Figure 4 - Project Site Plan (Armstrong Booster Station)**

Benedict Reservoir and Armstrong Booster Station

Not to Scale

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**10. Other Public Agencies Whose Approval is Required (e.g., permits, financial approval, or participation agreement):**

a. City of Jurupa Valley, Public Works Deparment
b. County of Riverside Department of Environmental Health
c. California Department of Public Health
d. Regional Water Quality Control Board (RWQCB), Santa Ana Region – National Pollutant Discharge Elimination System (NPDES) Construction General Permit
e. RWQCB, Santa Ana Region – Stormwater Pollution Prevention Plan (SWPPP)

**11. California Native Americans Tribes Consulted**
**Have California Native American Tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significant impacts to tribal cultural resources, procedures regarding confidentiality, etc.?**

JCSD provided "Notification of Consultation Opportunity" letters dated April 11, 2019 pursuant to Assembly Bill (AB 52) to Tribes that have previously requested such a notice. Letters were sent from JCSD to two tribes: Morongo Band of Mission Indians (MBMI) and San Manuel Band of Mission Indians (SMBMI).

The SMBMI responded in writing (via email) on May 14, 2019 requesting a copy of the historical/archaeological resources survey report and information regarding the depth of grading at the Benedict Reservoir Site. JCSD provided that information to SMBMI on May 17, 2019. On May 21, 2019 SMBMI requested certain mitigation measures, which are included in this initial study. (Refer to the responses in the Environmental Checklist under Section 5. Cultural Resources and Section 18. Tribal Cultural Resources). SMBI requested final copies of the plans and mitigation measures and concluded their input on the Project unless there is an unanticipated discovery of cultural resources during Project implementation.

The MBMI responded in writing to JCSD's request on April 24, 2019 requesting a copy of the Projects' cultural resources assessment and the results of the records search. The historical/archaeological resources survey report and a link to download the records search was provided to the MBMI on April 25, 2019. On May 22, 2019, MBMI requested either a third party review of the historical/archaeological resources survey report or MBMI tribal monitoring or inclusion in a tribal monitoring rotation. After consideration of the request, JCSD determined third party review of the historical/archaeological resources survey report is not warranted and have incorporated provisions for MBMI participation into certain mitigation measures. (Refer to the Environmental Checklist under Section 5. Cultural Resources and Section 18. Tribal Cultural Resources).

**12. Documents Used and/or Referenced in this Review:**

a. City of Jurupa Valley General Plan 2017 (JVGP)
b. City of Jurupa Valley General Plan 2017 Final Environmental Impact Report (JVGP FPEIR)
c. City of Jurupa Valley General Plan 2017 Draft Environmental Impact Report (JVGP DEIR)
d. *1200 Pressure Zone Evaluation Technical Memo.* (2016 Study)r
e. *Biological Resources Technical Report, Jurupa Community Services District's Benedict Reservoir Project*
f. *Coastal California Gnatcatcher United States Fish and Wildlife Service Focused Surveys for the 1.07-Acre Jurupa Community Services District's Benedict Reservoir Project* (CAGN)
g. *Historical/Archeological Resources Survey Report, Jurupa Community Services District 0.21-MG Benedict Reservoir Replacement Project*
h. *Geotechnical Investigation Report, New 1.1 MG Benedict Water Storage Tank*

## ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

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

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

## DETERMINATION

(To be completed by the Lead Agency)

On the basis of this initial evaluation:

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

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

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

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

JCSD finds that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required. ☐

Signature _____ Date 8/12/18

Printed Name & Title

Eddie Rhee, PE, Engineering Manager For JCSD

## EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

    a. **Earlier Analysis Used.** Identify and state where they are available for review.

    b. **Impacts Adequately Addressed.** Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

    c. **Mitigation Measures.** For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measure which were incorporated or

refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format selected.

9) The explanation of each issue should identify:

   a. the significance criteria or threshold, if any, used to evaluate each question; and

   b. the mitigation measure identified, if any, to reduce the impact to less than significance.

*Remainder of page intentionally left blank*.

| 1. Aesthetics | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Except as provided in the Public Resource Code Section 210099,would the project:** | | | | |
| a) Have a substantial adverse effect on a scenic vista? | ☐ | ☐ | ☒ | ☐ |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | ☐ | ☐ | ☐ | ☒ |
| c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from public accessible vantage points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | ☐ | ☐ | ☒ | ☐ |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☒ | ☐ |

**1a. Response:** *(Sources: JVGP DEIR; Project Description)*

**Less Than Significant Impact.** The JVGP identifies the Jurupa Mountains, Pedley Hills. Santa Ana River, La Sierra Hills, and the San Gabriel Mountains as scenic vistas. (JVGP DEIR, 4.1-17.) The Benedict Reservoir site is within the Jurupa Mountains and may be visible from different vantage view points throughout the City. The residential neighborhood southeast of the Jurupa Mountains has the most unobstructed view of Jurupa Mountains; however, the existing reservoirs are somewhat hidden behind a hill.

As noted in the Project Description, the Benedict Reservoir would replace the existing a 40-foot diameter 0.21 MG water storage reservoir with a 90-foot diameter 1.1 MG reservoir. The new 1.1 MG water storage reservoir and the remaining 1.0 MG water reservoir will be coated with a low-VOC coating the color of which is intended to blend in with the local hillside. The Armstrong Booster Station proposes to extend the existing steel case structure to install a new 550 GPM 30 HP pump at the Armstrong Booster Station site.

Construction activities for the proposed Benedict Reservoir and Armstrong Booster Station could have visual impacts from the construction equipment. However, these impacts would be temporary and short-term during construction. Once construction is completed, the Benedict Reservoir would be 2 feet taller and 50 feet wider than 0.21 MG reservoir being replaced. However, the proposed new 1.1 MG reservoir would be no taller than the existing 1.0 MG water storage reservoir and both reservoirs will be coated with paint that will blend in with the local surrounding hillside. The 550 GPM, 30 HP pump addition to the Armstrong Booster Station site would also not affect scenic vistas since the pump would be covered by the proposed steel structure extension, which is consistent with the existing structure. As such, implementation of the proposed Project would not obstruct any scenic views and impacts would be less than significant.

**1b. Response:** *(Sources: Caltrans; JVGP Figure 3-30 – Scenic Corridor and Figure 4-23 – Jurupa Valley Scenic Corridors and Roadways)*

**No Impact.** The proposed Project is not near a state scenic highway. The closest state scenic highway, identified by the California Department of Transportation (Caltrans), is the segment of State Route (SR) 243 from I-10 to SR-74, which is more than 32 miles east of the Project site. Therefore, the implementation of the Project would not damage any scenic resources within or visible from a state scenic highway. As such, no impacts will occur.

**1c. Response:** *(Sources: Project Description; US Census; California Department of Finance)*

**Less Than Significant Impact.** Per CEQA Guidelines Section 21071(a)(1), Jurupa Valley meets the definition of an urbanized area, which is an incorporated city with a population of at least 100,000 persons. As of 2010, Jurupa Valley has a population of 108,393 people. (US Census.) The California Department of Finance population estimate for Jurupa Valley as of January 1, 2019 is 106,318. The Armstrong Booster Station site is located within Light Agriculture (A-1) zone, which allows public utility facilities. The Benedict Reservoir site is located within the Manufacturing Heavy (M-H) zone, in which public utilities are not a prohibited use. Although the 1.1 MG reservoir will be larger than the 0.21 MG reservoir it will replace, this is not considered substantial alteration of a view shed, which currently includes two reservoirs. As such, implementation of the proposed Project will be less than significant.

**1d. Response:** *(Sources: JVGP, Project Description)*

**Less Than Significant Impact.** The Project will adhere to Jurupa Valley's Conservation and Open Space Dark Sky policies, shield outdoor lightning so as to contain the light on the Project site, and prohibit outdoor lighting to operate at unnecessary location, levels, and times, spill over to offsite areas, produce glare, and include interfere with astronomical viewing. The construction of the new reservoir at the Benedict Reservoir site and the new pump at the Armstrong Booster Station site, for the most part, would not necessitate the use of artificial light as construction is expected to occur during daylight hours. The Project does not propose additional lighting. Moreover, building and coating materials that will be used for the Project would prevent the creation of glare. The use of light may become necessary in the event of emergency repairs are required, in which case such lighting will be directed downwards and away from off-site structures and land uses. Such an event is expected to be infrequent and does not constitute a substantial new source of light. The Project does not propose removing or replacing existing street lights, or installing new street lights. As such, impacts are considered to be less than significant**.**

| 2. Agriculture and Forestry Resources | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☐ | ☒ |
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | ☐ | ☐ | ☐ | ☒ |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |
| e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |

**2a. Response:** *(Source: JVGP Figure 4-13 – Farmland in Jurupa Valley)*

**No Impact.** The Project Site does not include any mapped Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland). The Booster Reservoir is designated "Other Lands" and the Armstrong Booster Station is designated "Urban and Built-Up Land" by the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program and as depicted on Figure 4-13 – Farmland in Jurupa Valley of the Draft JVGP. (JVGP, p. 4-25.) Therefore, implementation of the proposed Project will not convert Farmland to a non-agricultural use. No impacts would occur.

**2b. Response:** *(Sources: JVGP Figure 2-5 – 2017 General Plan Land Use Plan; January 2019 City of Jurupa Valley Zoning Map (JVZM))*

**No Impact.** No portion of the Project site is zoned for agricultural use or subject to a Williamson Act contract. (JVGP, p. 4-25; JVZM.) No impacts would occur.

**2c. Response:** *(Sources: JVGP Figure 2-5 – 2017 General Plan Land Use Plan; January 2019 City of Jurupa Valley Zoning Map (JVZM))*

**No Impact.** The Project site is not zoned for forest land, timberland, or timberland zoned for Timberland Production areas. (JVGP, p. 4-25; JVZM.) No impacts would occur.

**2d.** **Response:** *(Sources: JVGP Figure 2-5 – 2017 General Plan Land Use Plan; January 2019 City of Jurupa Valley Zoning Map (JVZM))*

**No Impact.** There is no forest land in proximity to the Project site. (JVGP, p. 4-25; JVZM.) Therefore, no impact with regard to the loss of or conversion of forest land will occur.

**2e.** **Response:** (*Sources: JVGP Figure 4-13 – Farmland In Jurupa Valley, Figure 2-5 – 2017 General Plan Land Use Plan; January 2019 City of Jurupa Valley Zoning Map (JVZM))*

**No Impact.** As discussed in Threshold 2a above, there is no designated Farmland on the Project site. The proposed Project is located within an urban area and does not include any component that would result in the conversion of Farmland or forest land to other uses. As discussed in Response 2d above, there is no forest land on or in the proximity of the Project site. Therefore, no impacts with regard to the conversion of Farmland or forest land will occur.

| **3. Air Quality** | **Potentially Significant Impact** | **Less Than Significant With Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☐ | ☐ | ☒ |
| b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard? | ☐ | ☐ | ☒ | ☐ |
| c) Expose sensitive receptors to substantial pollutant concentrations | ☐ | ☐ | ☒ | ☐ |
| d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people? | ☐ | ☐ | ☒ | ☐ |

**3a.** **Response:** *(Source: South Coast Air Quality Management District's 2016 Air Quality Management Plan (AQMP))*

**No Impact.** The City Jurupa Valley is located within the South Coast Air Basin (Basin). The South Coast Air Quality Management District (SCAQMD) prepares the Air Quality Management Plan (AQMP) for the Basin. The AQMP sets forth a comprehensive program that will lead the Basin into compliance with all federal and state air quality standards. The AQMP's control measures and related emission reduction estimates are based upon emissions projections for a future development scenario derived from land use, population, and employment characteristics defined in consultation with local governments. Accordingly, if a project demonstrates compliance with local land use plans and/or population projections, then the AQMP would have taken into account such uses when it was developed.

Since the proposed Project consists of public utility improvements that in and of itself will not result in any changes to the existing land use patterns in the Project area, the Project does not

conflict with or obstruct implementation of the AQMP. Therefore, no impacts will occur. No mitigation is required.

**3b. Response:** *(SCAQMD CEQA Significance Thresholds (SCAQMD-C); Air Quality/Greenhouse Gas Analysis)*

**Less Than Significant Impact.** The portion of the Basin within which the proposed Project site is located is designated as a non-attainment area for ozone, PM-10, and PM-2.5 under the State standards and in a non-attainment area for ozone, and PM-2.5. (CARB.) The SCAQMD considers the thresholds for project-specific impacts and cumulative impacts to be the same. (SCAQMD-A.) Therefore, projects that exceed project-specific significance thresholds are considered by SCAQMD to be cumulatively considerable. Based on SCAQMD's regulatory jurisdiction over regional air quality, it is reasonable to rely on its thresholds to determine whether there is a cumulative air quality impact.

Air quality impacts can be described in a short- and long-term perspective. Short-term impacts will occur during site grading and Project construction. Long-term air quality impacts will occur once the Project is in operation. Operational emissions would only be from the additional electric pump at the Armstrong Booster station site and infrequent visits by vehicles driven by maintenance personnel, and are considered negligible; therefore, only short-term construction impacts were evaluated.

Short-term emissions were evaluated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 computer program. (Modeling output is included in Appendix A.) Short-term emissions consist of fugitive dust and other particulate matter, as well as exhaust emissions generated by construction-related vehicles. The default parameters within CalEEMod were used, except as identified below, and these default values generally reflect a worst-case scenario, which means that Project emissions are expected to be equal to or less than the estimated emissions.

The estimated construction period for the proposed Project is approximately 12 months as identified in **Table 1 – Estimated Construction Schedule**.

**Table 1 – Estimated Construction Schedule**

| Construction Activity | Start Date | End Date | Total Working Days |
|---|---|---|---|
| Demolition | January 20, 2020 | January 31, 2020 | 10 days |
| Grading | February 01, 2020 | March 13, 2020 | 30 days |
| Tank Construction | March 14, 2020 | August 28, 2020 | 120 days |
| Booster Station (Grading) | August 1, 2020 | October 9, 2020 | 50 days |
| Tank Coating | August 29, 2020 | October 30, 2020 | 45 days |
| Paving | November 1, 2020 | December 11, 2020 | 30 days |
| Pipe work (Trenching) | December 12, 2020 | December 19, 2020 | 5 days |

The equipment to be used for each construction activity is shown in **Table 2 – Construction Equipment List** based on engineering estimates. Each piece of equipment is assumed to operate 8 hours per day:

**Table 2 – Construction Equipment List**

| Construction Activity | Off-Road Equipment | Unit Amount | Hours/Day |
|---|---|---|---|
| Demolition | Concrete/Industrial Saw | 1 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| Grading | Crushing/Proc equipment | 1 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| Tank Construction | Crane[1] | 1 | 8 |
| | Forklift | 1 | 8 |
| | Tractors/Loaders/Backhoes | 1 | 8 |
| | Welder | 1 | 8 |
| Booster Station Construction (Grading) | Concrete/Industrial Saw[1] | 1 | 8 |
| | Crane | 1 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| Tank Coating | Air Compressor | 2 | 8 |
| | Pumps (Dehumidifier)[2] | 1 | 24 |
| Pipe work (Trenching) | Tractors/Loaders/Backhoe | 1 | 8 |
| Paving | Pavers | 1 | 8 |
| | Rollers | 1 | 8 |
| | Tractors/Loaders/Backhoes | 1 | 8 |

[1] The Crane and Concrete/industrial Saw are only required for a single day during Tank Construction and Booster Station construction, respectively. For modeling purposes, this equipment was assumed to operate the entire duration of each activity, which provides a worst case scenario.

[2] The CalEEMod equipment list does not include a dehumidifier. The Pump was used as a proxy for the dehumidifier because it most closely resembles the dehumidifier. While the precise specifications for the dehumidifier are currently unknown, it is anticipated to be an industrial sized piece of equipment that is diesel fueled. The dehumidifier will only be required for a single day, but will run for 24 hours. For modeling purposes, this equipment was assumed to operate the entire duration of this activity, which provides a worst case scenario.

- To evaluate Project compliance with SCAQMD Rule 403 for fugitive dust control, the Project utilized the mitigation option of watering the Project site three times daily which achieves a control efficiency of 61 percent for PM-10 and PM-2.5 emissions. Two (2) one-way vendor truck trips per day were added to the grading and tank construction activities to account for water truck trips.

- Four (4) vendor truck trips per day were added for material delivery and removal during tank construction, booster station, tank coating, and pipe work activities.

- Ten (10) total heavy duty truck trips (20 one-way trips) are anticipated during two days of demolition to remove the scrap steel from the disassembled tank. For modeling purposes, 10 one-way heavy duty truck trips were added each day during demolition, which provides a more conservative analysis. The default hauling trip length of 20 miles was assumed because the destination is unknown.

- Approximately 500 cu yd of soil will be imported during grading operations. Approximately 100 cu yd is assumed to be exported because of potentially unsuitable materials such as large rocks that don't break down. Truck capacity is assumed to be 16 cu yds, resulting in approximately 32 truckloads of import over the 30 grading day

period, or approximately one (1) truckload per day. The import site is currently unknown. Therefore, the CalEEMod default was utilized which assumes a hauling trip length of 20 miles per trip.

- Architectural coating includes both the recoating of the exterior of the existing 1.0 MG tank that will remain and the interior and exterior of the new 1.1 MG tank being constructed. The surface area to be coated for both the interior and exterior tank surfaces was calculated and entered into CalEEMod to estimate the emissions from these activities.

Maximum daily emissions from Project construction are summarized in **Table 3 – Estimated Maximum Daily Construction Emissions** and compared to the SCAQMD's daily regional thresholds:

**Table 3 – Estimated Maximum Daily Construction Emissions**

| Activity | Peak Daily Emissions (lb/day)[3] | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $NO_X$ | CO | $SO_2$ | PM-10 | PM-2.5 |
| **SCAQMD Daily Construction Thresholds[1]** | **75** | **100** | **550** | **150** | **150** | **55** |
| Demolition | 2.02 | 21.26 | 13.07 | 0.03 | 1.31 | 1.04 |
| Grading | 2.12 | 20.17 | 13.56 | 0.03 | **3.58** | **2.34** |
| Tank Construction | 1.26 | 11.65 | 8.17 | 0.02 | 0.79 | 0.58 |
| Booster Station Construction | **1.35** | **13.34** | **10.84** | **0.02** | 0.83 | 0.69 |
| Tank Coating | **8.45** | **13.25** | **13.93** | **0.03** | 0.83 | 0.79 |
| Pipe Work (Trenching) | 0.24 | 2.53 | 2.48 | 0.00 | 0.19 | 0.14 |
| Paving | 0.98 | 7.02 | 7.39 | 0.01 | 0.49 | 0.39 |
| **Maximum[2]** | **9.80** | **26.59** | **24.77** | **0.05** | **3.58** | **2.34** |
| **Exceeds Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** |

Source: *Air Quality/Greenhouse Gas Analysis*, Appendix A

Notes:

[1] SCAQMD CEQA Daily regional Significant from SCAQMD CEQA Air Quality Handbook (SCAQMD–B)

[2] Maximum emissions are the greater of either demolition, grading, pipe work, or paving alone, or the sum of tank construction and booster station construction or booster station construction and tank coating since these activities overlap.

[2] The numbers shown are the maximum summer or winter daily emissions (i.e., worst-case) results from CalEEMod and takes credit for reductions achieved through standard regulatory requirements (SCAQMD Rule 403).

As shown in **Table 3**, the maximum daily criteria pollutant emissions from construction of the proposed Project will be below the SCAQMD daily regional thresholds for all criteria pollutants. Impacts would be less than significant**.** No mitigation is required.

In addition to the daily regional thresholds, the SCAQMD has developed localized significance threshold (LST) methodology that can be used by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts (both short- and long-

term) (SCAQMD-C). LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area (SRA). The Project is located in SRA 23.

According to the LST methodology, only on-site emissions need to be analyzed. Emissions associated with vendor and worker trips are mobile source emissions that occur off site. The emissions analyzed under the LST methodology are $NO_x$, CO, PM-10, and PM-2.5. SCAQMD has provided LST lookup tables to allow users to readily determine if the daily emissions for proposed construction or operational activities could result in significant localized air quality impacts for projects five acres or smaller. The LST tables can be used as a screening tool to determine if dispersion modeling would be necessary. If project-related emissions are below the LST table emissions, no further analysis is necessary. The Project site disturbs approximately 0.8 acres. Therefore, the LST for one-acre site was utilized.

The LST thresholds are estimated using the maximum daily disturbed area (in acres) and the distance of the Project to the nearest sensitive receptors (in meters). The closest sensitive receptors to the Project construction site are existing residences along uses along Sandra Drive approximately 372 feet (113 meters) southeast of the reservoir site and residential uses along Armstrong Road and Karen Lane adjacent to the booster station site. According to LST methodology, projects with boundaries closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters. Therefore, a receptor distance of 25 meters (85 feet) was used to ensure a conservative analysis. **Table 4 – Unmitigated LST Results for Daily Construction Emissions** identifies the worst case on-site construction emissions of the proposed Project.

**Table 4 – Unmitigated LST Results for Daily Construction Emissions**

| Pollutant | Peak Daily Emissions (lb/day) | | | |
|---|---|---|---|---|
| | $NO_X$ | CO | PM-10 | PM-2.5 |
| **LST Threshold for 1-acre at 25 meters** | **118** | **602** | **4** | **3** |
| Demolition | 18.84 | 12.38 | 1.02 | 0.95 |
| Grading | 19.34 | 13.04 | **3.41** | **2.29** |
| Tank Construction | 10.37 | 7.34 | 0.54 | 0.50 |
| Booster Station Construction | **12.90** | **10.36** | 0.69 | 0.65 |
| Tank Coating | **12.83** | **13.73** | 0.77 | 0.77 |
| Pipe Work (Trenching) | 2.11 | 2.28 | 0.13 | 0.12 |

| Pollutant | Peak Daily Emissions (lb/day) | | | |
|---|---|---|---|---|
| | $NO_X$ | CO | PM-10 | PM-2.5 |
| Paving | 7.00 | 7.07 | 0.40 | 0.37 |
| **Maximum**[1, 2] | **25.73** | **24.09** | **3.41** | **2.29** |
| **Exceeds Threshold?** | **No** | **No** | **No** | **No** |

Source: *Air Quality/Greenhouse Gas Analysis*

Notes:

[1] Maximum emissions are the greater of either demolition, grading, pipe work, or paving alone, or the sum of tank construction and booster station construction or booster station construction and tank coating since these activities overlap.

[2] The numbers shown are the maximum summer or winter daily emissions (i.e., worst-case) results from CalEEMod and takes credit for reductions achieved through standard regulatory requirements (SCAQMD Rule 403).

As shown in **Table 4**, all concentrations of pollutants would be below the SCAQMD's short-term LST. Therefore, short-term LST significant air quality impacts would be less than significant**.** No mitigation is required.

The long-term emissions from the reservoir, as discussed previously, are primarily in the form of mobile source emissions, with no stationary sources of emissions present. The new pump at the booster station will be similar to the existing pumps and is electric. The booster station has an existing diesel-powered emergency generator. No changes are required for this stand-by generator. According to the LST methodology, LSTs only apply to the operational phase if a project includes stationary sources or on-site mobile equipment generating on-site emissions. The proposed Project does not include such uses. Thus, long-term LST analysis is not required.

Therefore, since the Project's short-term emissions do not exceed the SCAQMD established thresholds of significance, and since the Project does not include stationary sources or on-site mobile equipment generating on-site emissions, the Project will not result in a cumulatively considerable net increase in criteria pollutant emissions for which the Project region is non-attainment and thus impacts are considered less than significant. No mitigation measures are required.

**3c. Response:** *(Sources: SCAQMD 1993; Air Quality/Greenhouse Gas Analysis)*

**Less Than Significant Impact.** People most likely to be affected by air pollution, as identified by the SCAQMD, may include children, the elderly, and people with cardiovascular and chronic respiratory diseases. Sensitive receptors may include residences, schools, playgrounds, athletic facilities, childcare centers, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive receptors in the Project vicinity include existing residences along Sandra Drive approximately 372 feet (113 meters) southeast of the reservoir site and residential uses along Armstrong Road and Karen Lane adjacent to the booster station site. The construction emissions were found to be less than significant, as indicated above in Response 3b above. Hence the Project will not expose sensitive receptors to substantial

pollutant concentrations and impacts are considered less than significant. No mitigation is required.

**3d. Response:** (*Source: Project Description)*

**Less Than Significant Impact.** The Project presents the potential for generation of objectionable odors in the form of diesel exhaust during construction in the immediate vicinity of the Project site. Odors generated during construction will be short-term, be limited to the Project site, and would cease to occur after construction is completed. Only infrequent maintenance of the proposed waterline facilities will be required in which any potential odors would disperse quickly and cease after maintenance activities are completed. No other emissions are anticipated to result from the Project that could adversely affect substantial numbers of people. As such, impacts will be less than significant impact. No mitigation is required.

| **4. Biological Resources** | **Potentially Significant Impact** | **Less Than Significant With Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Have a substantial adverse effect, either directly or through habitat modification, 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 U.S. Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☒ |
| c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | ☐ | ☐ | ☐ | ☒ |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | ☐ | ☐ | ☐ | ☒ |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☐ | ☐ | ☒ |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | ☐ | ☒ | ☐ | ☐ |

**4a. Response:** *(Sources: Biological Resources Technical Report; Site Visit)*

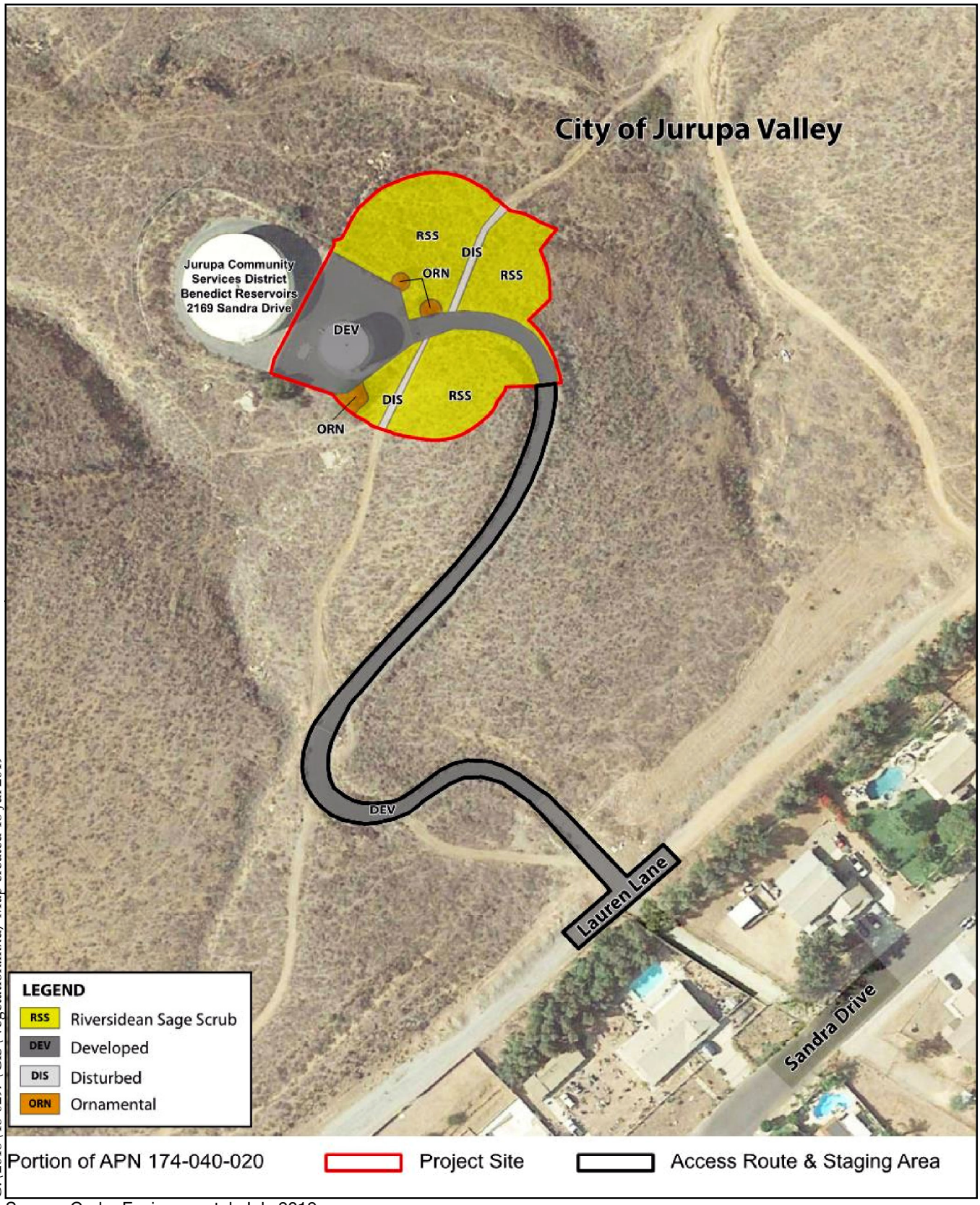
**Less Than Significant Impact.** The Armstrong Booster Station site is within a developed residential neighborhood. The only portion of the site that is not paved or covered with the booster station building is the landscaped area between the fence and sidewalk, which varies in depth from approximately 20 to 25 feet adjacent to Armstrong Road and Karen Lane. Due to the disturbed nature of the site and given that all work connected with the Armstrong Booster Station will take place inside the fenced in area of the site and not result in the removal of any vegetation, the booster station component will not result in any direct or indirect impacts to candidate, sensitive, or special status species.

To ascertain impacts to biological resources at the Benedict Reservoir site, Cadre Environmental conducted a general reconnaissance survey and focused biological surveys for sensitive plants, coastal California gnatcatcher, and burrowing owl. The results of these surveys are documented in the *Biological Resources Technical Report, Jurupa Community Services District's Benedict Reservoir Project* (BRTR), and the *Coastal California Gnatcatcher United States Fish and Wildlife Service Focused Surveys* document (CAGN Focused Surveys). These reports are included as Appendices B.1 and B.2 of this Initial Study and the results summarized below.

Existing biological resource conditions within and adjacent to the Benedict Reservoir Tank Site were initially investigated through review of pertinent scientific literature. Federal register listings, protocols, and species data provided by the United States Fish and Wildlife Service (USFWS) were also reviewed in conjunction with anticipated federally listed species potentially occurring within the region of the Project Site. The California Natural Diversity Database (CNDDB) was also reviewed for all pertinent information regarding the locations of known occurrences of sensitive species in the vicinity of the reservoir site. In order to characterize and identify potential sensitive plant and wildlife habitats and to establish the accuracy of the data identified in the literature search, a reconnaissance survey of the reservoir site was conducted by Ruben Ramirez of Cadre Environmental (USFWS Permit 780566-14, CDFW Permit 02243) on April 2, 2019. During the reconnaissance survey habitat assessments were conducted for, but not limited to, the following target species/groups: sensitive plants, coastal California gnatcatcher (a federally threatened and California species of special concern), burrowing owl (a California species of special concern), and San Bernardino kangaroo rat (a federally endangered and California species of special concern.) (BRTR, pp. 2–3.) Because suitable habitat is present at the reservoir site, protocol surveys for the coastal California gnatcatcher (CAGN), and sensitive plant species were conducted. The focused surveys were conducted on-foot and covered all suitable habitats on the reservoir site.

The dominant vegetation community documented within and adjacent to the approximately 1.07-acre reservoir site is Riversidean sage scrub (RSS); other communities present are classified as Developed (DEV), which consists of the existing facilities and access road, Disturbed (DIS), and Ornamental Trees (ORN), which includes Eucalyptus and Peruvian pepper trees adjacent to reservoir site. (BRTR, p. 9.) The locations of these communities are shown on **Figure 5 – Vegetation Communities Map** and the acreages presented in **Table 5 –**

**Acreages of the Vegetation Communities Present on the Reservoir Site** on the page following **Figure 5**.




G:\2018\18-0297\GIS\Vegetation.mxd; Map created 18 Jul 2019

Source: Cadre Environmental, July 2019.

**Figure 5 - Vegetation Communities Map**

Benedict Reservoir and Armstrong Booster Station

Not to Scale

ALBERT A. WEBB ASSOCIATES

**Table 5 – Acreages of the Vegetation Communities Present on the Reservoir Site**

| Vegetation Community | Acres |
|---|---|
| Riversidean Sage Scrub | 0.52 |
| Developed (Existing Facilities and Access Road) | 0.51 |
| Disturbed | 0.02 |
| Ornamental Trees | 0.02 |
| Total | 1.07 |

Source: *Biological Resources Technical Report, Jurupa Community Services District's Benedict Reservoir Project, Table 1, p. 9.*

Based on the results of the initial habitat assessment and review of the western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and CNDDB, a total of ten (10) sensitive plant species have potential of occurring within the vicinity of the reservoir site. (BRTR, pp. 19–20.) As indicated in **Table 6**, no sensitive habitats, state or federally listed threatened, endangered, or MSHCP narrow endemic plants were observed onsite during the focused surveys conducted during the spring of 2019. (BRTR, p. 18.)

**Table 6– Reservoir Site Sensitive Plant Species Assessment**

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **San Diego ambrosia**<br>(*Ambrosia pumila*)<br><br>FE<br>CRPR List 1B.1<br>MSHCP Narrow Endemic | San Diego ambrosia is known from Baja California, Mexico, and San Diego and Riverside counties in the United States. It blooms May to September. San Diego ambrosia occurs primarily on upper terraces of rivers and drainages as well as in open grasslands, openings in coastal sage scrub, and occasionally in areas adjacent to vernal pools. | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |
| **Plummer's mariposa-lily**<br>(*Calochortus plummerae*)<br><br>CRPR 4.2 | Perennial bulbiferous herb which generally blooms from May to June within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and grassland habitats with granite and rocky substrates. (CNPS 2019) | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |

| **Species Name** (*Scientific Name*) Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Parry's spineflower** (*Chorizanthe parryi var. parryi*)<br><br>CRPR 1B.1 | Annual herb, generally blooms from April to June within chaparral, cismontane woodland, coastal scrub, grassland habitats with sandy, rocky openings. (CNPS 2019) | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |
| **Slender-horned spineflower** (*Dodecahema leptoceras*)<br><br>CRPR 1B.1<br>FE/SE | Annual herb which generally blooms from April to June within chaparral, cismontane woodland and coastal scrub (alluvial fan) with sandy substrates. (CNPS 2019) | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |
| **Mesa horkelia** (*Horkelia cuneata ssp. Puberula*)<br><br>CRPR 1B.1 | Perennial herb which generally blooms from February to September within chaparral (maritime), cismontane woodland and coastal scrub with sandy or gravelly substrates. (CNPS 2019) | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |
| **Parish's desert-thorn** (*Lycium parishii*)<br><br>CRPR 2B.3 | Perennial herb which generally blooms from March to April in coastal scrub and Sonoran Desert scrub habitats. (CNPS 2019) | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |
| **Pringle's monardella** (*Monardella pringlei*)<br><br>CRPR 1A | Annual herb which generally blooms from May to June in coastal scrub dominated sandy substrates. (CNPS 2019) | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |
| **Brand's phacelia** (*Phacelia stellaris*)<br><br>CRPR List 1B.1<br>MSHCP Narrow Endemic | Brand's phacelia is an annual herb. It blooms March to June. This species occurs in coastal sage scrub and dune habitats. | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |
| **San Miquel savory** (*Satureja chandleri*)<br><br>FT/SE<br>CRPR List 1B.2<br>MSHCP Narrow Endemic | San Miquel savory is a perennial shrub that blooms from March to July. This species occurs in rocky habitats within chaparral, coastal scrub, riparian woodland, and grassland habitats. | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |

| **Species Name** (*Scientific Name*) Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Chaparral ragwort** (*Senecio aphanactis*) CRPR 2B.2 | Annual herb which generally blooms from January to May within chaparral, cismontane woodland and coastal scrub habitats. (CNPS 2019) | Not detected within the reservoir site during focused spring 2019 sensitive plant surveys. |
| **California Native Plant Society (CNPS): California Rare Plant Rank (CRPR)**<br>CRPR 1A – plants presumed extinct in California<br>CRPR 1B – plants rare, threatened, or endangered in California, but more common elsewhere<br>CRPR 2A – plants presumed extirpated in California but common elsewhere<br>CRPR 2B – plants rare, threatened, or endangered in California but more common elsewhere<br>CRPR 3 – plants about which we need more information, a review list<br>CRPR 4 – plants of limited distribution, a watch list<br>.1 – Seriously endangered in California<br>.2 – Fairly endangered in California<br>.3 – Not very endangered in California<br><br>**Federal (USFWS) Protection and Classification**<br>FE – Federally Endangered<br>FT – Federally Threatened<br>FC – Federal Candidate for Listing<br><br>**State (CDFW) Protection and Classification**<br>SE – State Endangered<br>ST – State Threatened | | |

Source: *Biological Resources Technical Report, Jurupa Community Services District's Benedict Reservoir Project,* Table 2, pp. 19–20.

Based on the results of the initial habitat assessment, focused surveys for coastal California gnatcatcher, and review of the western Riverside County MSHCP and CNDDB, a total of nineteen (19) sensitive wildlife species have the potential of occurring within the region of the reservoir site. As indicated in **Table 7 – Reservoir Site Sensitive Wildlife Species Assessment**, no state or federally listed threatened, endangered, or MSHCP target species were observed onsite during the habitat assessment or focused surveys conducted during the spring of 2019.

**Table 7 – Reservoir Site Sensitive Wildlife Species Assessment**

| **Species Name** (*Scientific Name*) Status | **Habitat Description** | **Comments** |
|---|---|---|
| **INVERTEBRATES** | | |
| **Delhi Sands flower-loving fly** (*Rhaphiomidas terminatus abdominalis*)<br><br>FE | Restricted to Delhi sand formations in Riverside and San Bernardino Counties. | Not expected to occur onsite based on a lack of suitable soils. |
| **REPTILES** | | |
| **Orange-throated whiptail** (*Aspidoscelis hyperythra*)<br><br>WL | The orange-throated whiptail occurs in Riversidean sage scrub and chaparral where loose soils and occasional rocky areas are found. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation. |
| **Coast horned lizard** (*Phrynosoma blainvillii*)<br><br>SSC | The horned lizard occurs primarily in scrub, chaparral, and grassland habitats. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation. |
| **BIRDS** | | |
| **Bell's sage sparrow** (*Artemisiospiza belli belli*)<br><br>CWL | This species is typically found in chaparral on alluvial fans and foothills. | Not observed or expected to occur onsite based on a lack of suitable habitat. |
| **Cooper's hawk** *(Accipiter cooperii)*<br><br>*SSC* | Cooper's hawk is most commonly found within or adjacent to riparian/oak forest and woodland habitats. This uncommon resident of California increases in numbers during winter migration. | Cooper's hawks occasionally nest in large pines and Eucalyptus trees. No nests were documented onsite and the majority of ornamental trees are small in stature and not expected to be utilized for nesting. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Southern California rufous-crowned sparrow**<br>(*Aimophila ruficeps canescens)*<br><br>CWL | Southern California rufous-crowned sparrow is a non-migratory bird species that primarily occurs within sage scrub and grassland habitats and to a lesser extent chaparral sub-association. This species generally breeds on the ground within grassland and scrub communities in the western and central regions of California. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation. |
| **Golden eagle**<br>(*Aquila chrysaetos*)<br><br>CWL, SFP | Within southern California, the species prefers grasslands, brushlands (coastal sage scrub and chaparral), deserts, oak savannas, open coniferous forests, and montane valleys. | Not expected to occur onsite based on a lack of suitable habitat. |
| **Burrowing owl**<br>(*Athene cunicularia)*<br><br>SSC | The burrowing owl uses predominantly open land, including grassland, agriculture (e.g., dry-land farming and grazing areas), playa, and sparse coastal sage scrub and desert scrub habitats. Some breeding burrowing owls are year-round residents and additional individuals from the north may winter throughout the region. | Not expected to occur onsite. No suitable burrows documented within the Project Site. |
| **Northern Harrier**<br>(*Circus cyaneus*)<br><br>SSC | The northern harrier frequents open wetlands, wet/lightly grazed pastures, fields, dry uplands/prairies, mesic grasslands, drained marshlands, croplands, meadows, grasslands, open rangelands, fresh and saltwater emergent wetlands. | Not observed or expected to occur onsite based on a lack of suitable habitat. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Least Bell's vireo**<br>*(Vireo bellii pusillus)*<br><br>*FE, SE* | Least Bell's vireo resides in riparian habitats with a well-defined understory including southern willow scrub, mule fat, and riparian forest/woodland habitats. | Not expected to occur onsite based on a lack of riparian within or adjacent to the Project Site. |
| **Southwestern willow flycatcher**<br>*(Empidonax traillii extimus)*<br><br>*FE, SE* | The southwestern willow flycatcher is narrowly distributed. Although the preferred habitat, riparian woodland and select other forests, is well distributed within all, few current locations for the willow flycatcher have been documented. | Not expected to occur onsite based on a lack of riparian within or adjacent to the Project Site. |
| **Loggerhead shrike**<br>(*Lanius ludovicianus*)<br><br>SSC | This species of shrike hunts in open or grassy areas and nests in large chaparral shrubs such as ceanothus and lemonade berry. | Not expected to occur onsite based on a lack of suitable habitat |
| **Coastal California gnatcatcher**<br>*(Polioptila californica californica)*<br><br>*FT/SSC* | The coastal California gnatcatcher is a non-migratory bird species that primarily occurs within sage scrub habitats in coastal southern California dominated by California sagebrush. | No federally threatened coastal California gnatcatchers documented within the Survey Area during six (6) USFWS focused surveys (Cadre Environmental 2019). The species may occur onsite in the future based on the presence of suitable habitat and observations north of the property in the Jurupa Mountains (USFWS 2019, 1995 observations). |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **MAMMALS** | | |
| **Northwestern San Diego pocket mouse**<br>*(Chaetodipus fallax fallax)*<br><br>*SSC* | The northwestern San Diego pocket mouse occurs in coastal sage, upland sage scrubs, and alluvial fan sage scrub, sage scrub/grassland ecotones, chaparral, and desert scrubs at all elevations up to 6,000 feet. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation. |
| **San Bernardino kangaroo rat**<br>(*Dipodomys merriami parvus*)<br><br>FE/SSC | Prefers alluvial scrub, coastal sage scrub habitats with sandy and gravelly substrates. | Not expected to occur onsite based on a lack of alluvial fan or adjacent terrace habitats. |
| **Western mastiff bat**<br>(*Eumops perotis californicus*)<br><br>SSC | Roosts in rocky areas and forages in grassland, shrublands, and woodlands. | Not expected to occur onsite based on a lack of suitable habitat. |
| **Western yellow bat**<br>(*Lasiurus xanthinus*)<br><br>SSC | Roosts in the skirts of palm trees and forages in adjacent habitats. | Not expected to occur onsite based on a lack of suitable foraging habitat within the vicinity of the Project Site. |
| **San Diego black-tailed jackrabbit**<br>(*Lepus californicus bennettii*)<br><br>SSC | The San Diego black-tailed jackrabbit in open habitats, primarily including grasslands, sage scrub, alluvial fan sage scrub, and Great Basin sage scrub. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation |
| **Los Angeles pocket mouse**<br>(*Perognathus longimembris brevinasus*)<br><br>SSC | Low elevation grassland alluvial sage scrub and coastal sage scrub habitats. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation |
| **Federal (USFWS) Protection and Classification**<br>FE – Federally Endangered<br>FT – Federally Threatened<br>FC – Federal Candidate for Listing | | |

| **Species Name** (*Scientific Name*) Status | **Habitat Description** | **Comments** |
|---|---|---|
| **State (CDFW) Protection and Classification**<br>SE – State Endangered<br>SPE – State Proposed Endangered<br>ST – State Threatened<br>SSC – State Species of Special Concern<br>CWL – California Watch List<br>SPF – State Fully Protected | | |

Source: *Biological Resources Technical Report, Jurupa Community Services District's Benedict Reservoir Project,* Table 3, pp. 21–24.

As indicated in the above table, there is moderate potential for eight (8) sensitive wildlife species to occur at the reservoir site within the Riversidean sage scrub (RSS) community. However, impacts to the 0.52 acres of Riversidean sage scrub at the reservoir site represent less than significant impacts with regard to direct or indirect impacts to candidate, sensitive, or special status species. (BRTR, pp. 18, 21.)

There is a potential for short-term direct (i.e. habitat disturbance or removal) and indirect (i.e. noise) impacts to birds protected by the Migratory Bird Treaty Act (MBTA) if construction takes during avian nesting season, which is generally from February 15 to August 31. To avoid impacts to nesting birds if construction occurs during the nesting season, mitigation measure **MM BIO 1**, which requires preconstruction surveys, shall be implemented.

> **MM BIO 1**: To avoid direct and indirect impacts to nesting birds, if construction takes place between February 16 and August 31st, a qualified biologist (the "Project Biologist") retained by the Jurupa Community Services District, shall conduct preconstruction nesting bird survey(s) no sooner than 14 days prior to initiation of ground disturbing activities, to document the presence of absence of nesting birds within or directly adjacent to (within 100 feet) the construction zone. If no active nests are found during the survey, construction activities may proceed. The qualified biologist shall serve as a biological monitor during those periods when construction activities occur near active nest areas to ensure that no inadvertent impacts on these nests occur.
>
> If active nests are documented during the preconstruction survey(s), species-specific measures shall be prepared by the Project Biologist and implemented to prevent abandonment of the active nest. At a minimum, grading in the vicinity of an active nest shall be monitored by the Project Biologist and if necessary. Grading in the vicinity of the nest shall be postponed until the young birds have fledged. A minimum exclusion buffer of 100 feet shall be maintained during construction, depending on the avian species and location of nest. The perimeter of the nest setback zone shall be fenced or adequately demarcated with stakes and flagging at 20-foot intervals, and construction personnel and activities restricted from the area.

A survey report by a qualified biologist verifying that no active nests are present, or that the young have fledged, shall be submitted to Jurupa Community Services District prior to initiation of construction activities in the nest-setback zone. A final report of the findings, prepared by a qualified biologist, shall be submitted to Jurupa Community Services District prior to construction-related activities that have the potential to disturb any active nests during the nesting season.

Any nest permanently vacated for the season would not require protection.

If construction takes place outside of the nesting season, i.e., between September 1 and February 15, no preconstruction nesting bird surveys are required.

To avoid impacts to biological resources outside the reservoir site area surveyed, mitigation measure **MM BIO 2**, which requires all construction activities in connection with the reservoir component of the Project, including staging and equipment storage, and personnel to stay within the Project Site as shown on **Figure 5 – Vegetation Communities,** or on paved public roadways shall be implemented.

**MM BIO 2**: To eliminate direct impacts to potentially sensitive biological resources in the vicinity of the Benedict Reservoir site as a result of construction activities and personnel and equipment inadvertently going outside existing paved areas or the Project Site for the Benedict Reservoir as shown on **Figure 5 – Vegetation Communities Map**, the limits of the area surveyed shall be shown on the plans and language included in the construction specification and contract documents that state "Any construction activities, equipment, and/or personnel shall remain within the reservoir site or on paved public rights-of-way."

No construction related staging or storage shall take place outside of the area identified as Project Site as shown on **Figure 5 – Vegetation Communities Map**, the Armstrong Booster station site, or paved public rights-of-way. In the event the contractor wants to stage or store equipment at another location, the contractor shall be responsible for obtaining environmental clearance from the Jurupa Community Services District prior to the use of such location.

For the reasons stated above, with implementation of mitigation measures **MM BIO 1** and **MM BIO 2**, impacts with regard to regard to direct or indirect impacts to candidate, sensitive, or special status species will be less than significant.

**4b. Response:** *(Sources: Biological Resources Technical Report; Site Visit)*

**No Impact.** The Armstrong Booster station site is developed except for ornamental landscaping; there are no sensitive habitats present at that location. According to the *Biological Resources Technical Report*, no sensitive habitats, including Western Riverside County MSHCP riparian, riverine, or vernal pool resources were documented within or adjacent to the reservoir site. For these reasons there will be no impacts with regard to adversely effecting riparian habitat or other sensitive natural communities. (BRTR, pp. 18, 27.)

**4c. Response:** *(Sources: Biological Resources Technical Report; Site Visit)*

**No Impact.** The Armstrong Booster station site is developed except for ornamental landscaping; thus, there are no state or federally protected wetlands present at that location. According to the *Biological Resources Technical Report*, no wetlands or jurisdictional resources regulated by the United States Army Corps of Engineers, California Department of Fish and Wildlife, or Regional Water Quality Control Board were documented within the Benedict Reservoir site. For these reasons there will be no impacts with regard to state or federally protected wetlands. (BRTR, p. 25.)

**4d. Response:** *(Sources: Project Description; Western Riverside County Multiple Species Habitat Conservation Plan)*

**Less Than Significant Impact.** Neither the Benedict Reservoir site or Armstrong Booster Station site are within a migratory corridor and there are no native wildlife nursery sites on or in proximity to the Benedict Reservoir or Armstrong Booster Station. There are no watercourses or rivers on or in proximity to the Benedict Reservoir or Armstrong Booster Station. There are no MSHCP-designated linkages or noncontiguous habitat blocks in proximity to either the Benedict Reservoir or Armstrong Booster Station. (BRTR, p. 25.) Implementation of the Project will not result in habitat fragmentation because the Project will construct the new reservoir and booster station at locations where facilities are already present. For these reasons impacts with regard to substantially interfering with the movement of any native resident or migratory fish or wildlife species or impeding the use of a native wildlife nursery site will be less than significant.

**4e. Response:** *(Sources: Project Description; Biological Resources Technical Report)*

**Less Than Significant Impact.** Chapter 7.55 (Street Trees) of Jurupa Valley's Municipal Code states:

*No person, firm, corporation, public district, public agency or political subdivision shall remove or severely trim any tree planted in the right-of-way of any city highway without first obtaining a permit from the Public Works Director to do so. Such permit shall be issued without fee, if the Public Works Director is satisfied that such removal or trimming is in the public interest or is necessary for the improvement of the right-of-way or the construction of improvements on adjacent land. He or she may impose such conditions as he or she deems reasonable or necessary, including requirements for the work to be done only by a qualified tree surgeon or tree trimmer actually engaged in that business, and for bond, insurance or other security to protect person and property from injury or damage. The provisions limiting trimming of trees shall not apply to any public utility maintaining overhead power of communication lines pursuant to franchise, where necessary to prevent interference of a tree with such installation. A permit for removal of a tree may be conditioned upon its relocation or replacement by one or more other trees of a kind or type to be specified in the permit." (City of Jurupa Valley, Section 13.10.050, Tree Removal)*

The non-native Eucalyptus and Peruvian pepper trees located within the Benedict Reservoir site are not located within Jurupa Valley right-of-way and do not meet the jurisdictional requirements for protection under the Jurupa Valley's Municipal Code (Section 13.10.050,Tree Removal). (BRTR, pp 17–18.) Therefore, impacts with regard to conflicting with any local policies or ordinances protecting biological resources will be less than significant.

**4f. Response:** *(Sources: Biological Resources Technical Report; Western Riverside County MSHCP: RCA MSHCP Information Map)*

**Less Than Significant Impact.** The Project site and all of JCSD's service area is located within the boundaries of the Western Riverside MSHCP. Although JCSD is not a Permittee, coverage under the MSHCP (and therefore, take authorization under the MSHCP) can be obtained by seeking "Third Party Take Authorization" through the Western Riverside County Regional Conservation Authority. As impacts to biological resources will avoided through mitigation measures, coverage will not likely be sought. Although JCSD is not a Permittee to the MSHCP, the proposed Project will not conflict with the MSHCP as discussed below.

The MSHCP identifies a series of Criteria Cells and identifies the conservation goals for each Criteria Cell. The Project is located within the Jurupa Area Plan of the MSHCP Subunit 2 Jurupa Mountains within Cell Group G. The Benedict Reservoir site is located in the northeast portion of Criteria Cell 8 and the Booster Station site is located in the middle of Criteria Cell 50. Both of these Criteria Cells are located in the northwest portion of Cell Group G. Conservation within this Cell Group will range from10% – 20% of the Cell Group focusing in the northwestern portion of the Cell Group. The Project's direct impacts to 0.52 acres of Riversidean sage scrub will not conflict with the MSHCP reserve design and conservation goals for Criteria Cell 8, Criteria Cell 50, Cell Group G, or Proposed Noncontiguous Habitat Block 2. (BRTR, p. 25.)

<u>MSHCP Section 3.2.1 (The MSHCP Plan Map)</u>
The MSHCP Plan Map identifies the following four categories of property within the MSCHP Plan Area: Criteria Area, Public/Quasi-Public Lands (PQP), Rural Mountainous Designation, and American Indian Lands. The Benedict Reservoir site and Armstrong Booster Station site are not identified as one of these four categories. As such, the Project is compliant with Section 3.2.1 of the MSHCP.

<u>MSHCP Section 6.1.2 (Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools)</u>
No riparian, riverine or vernal pool resources were documented within or adjacent to the Benedict Reservoir site and there are none of these resources at the Armstrong Booster Station site. As such, the Project is compliant with Section 6.1.2 of the MSHCP. (BRTR, p. 27.)

<u>MSHCP Section 6.1.3 (Protection of Narrow Endemic Plant Species)</u>
The Armstrong Booster Station site is not within a Narrow Endemic Plant Species Survey Area. (RCA MSHCP Information Map.) The Benedict Reservoir site is within Narrow Endemic Plant Species Survey Area 7, which includes the following target plant species: San Diego ambrosia, Brand's Phacelia, and San Miguel savory. Focused sensitive plant surveys were conducted at the reservoir site during the spring of 2019 and no MSHCP narrow endemic plants were

documented within the Project Site. (BRTR, p. 26; MSHCP.) As such, the Project is compliant with Section 6.1.3 of the MSHCP.

MSHCP Section 6.1.4 (Guidelines Pertaining to Urban Wildlands Interface)
The MSHCP Urban/Wildland Interface Guidelines are intended to address indirect effects associated with locating development in proximity to the MSHCP Conservation Area. Neither the Benedict Reservoir site (BRTR, p. 27) nor the Armstrong Booster Station site are located in proximity to an MSHCP Conservation Area. As such, the Project is compliant with Section 6.1.4 of the MSHCP.

MSHCP Section 6.3.2 (Additional Survey Needs and Procedures)
The Armstrong Booster station is not within a special survey area for amphibians, burrowing owls, Criteria Area Plant Species, or mammals. (RCA MSHCP Information Map.) The Benedict Reservoir site is not within a special survey area for amphibians, Criteria Area Plant Species, or mammals. The Benedict Reservoir site is within the burrowing owl survey area. No suitable burrowing owl burrows potentially utilized for refugia and/or nesting were documented within or adjacent to the reservoir site. No owls were detected on the reservoir site during six (6) protocol coastal California gnatcatcher surveys during which time, if burrowing owls were present, individuals would have been detected. Implementation of mitigation measure **MM BIO 1**, which requires a preconstruction survey for nesting birds, will meet the MSHCP's 30-day preconstruction survey requirement for burrowing owls. (BRTR, p. 26.) As such, the Project is compliant with Section 6.3.2 of the MSHCP.

MSHCP Section 7.5.3 (Construction Guidelines)
The MSHCP Construction Guidelines are intended to address construction effects in proximity to the MSHCP Conservation Area and PQP Lands. These guidelines pertain to activities such as sediment and erosion control, timing of construction activities, stream diversions, footprint of disturbance areas, exotic species removal, training of construction personnel, equipment maintenance, and disposal of waste, dirt, rubble, or trash. Neither the Benedict Reservoir site (BRTR, p. 27) nor the Armstrong Booster Station site are located in proximity to an MSHCP Conservation Area; thus, this section is not applicable. As such, the Project is compliant with Section 7.5.3 of the MSHCP.

MSHCP Appendix C (Standard Best Management Practices)
The MSHCP Standard Best Management Practices pertain to the same types of activities as the MSHCP Construction Guidelines and will be addressed in either a Storm Water Pollution Prevention Plan (SWPPP) or an erosion and sediment control plan.

Therefore, as discussed above, the proposed Project will be compliant with the MSHCP. The Project site is not located within the Stephen's kangaroo rat Core Reserve and is not located within other habitat conservation plans. Therefore, impacts with regard to conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, to state habitat conservation plan will be less than significant with implementation of mitigation measure **MM BIO 1**.

| 5. Cultural Resources | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? | ☐ | ☐ | ☒ | ☐ |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? | ☐ | ☒ | ☐ | ☐ |
| c) Disturb any human remains, including those interred outside of formal cemeteries? | ☐ | ☐ | ☒ | ☐ |

**5a. Response:** *(Source: CRM Tech)*

**Less Than Significant Impact.** The Armstrong Booster Station site is within a developed residential neighborhood. The only portion of the site that is not paved or covered with the booster station building is the landscaped area between the fence and sidewalk, which varies in depth from approximately 20 to 25 feet adjacent to Armstrong Road and Karen Lane, which will not be disturbed. The pump and associated electrical panel will be constructed on existing paved area, adjacent to the existing booster station. Construction activities associated with Armstrong Booster Station will take place inside the fenced area of the site. Therefore the Booster Station component will not result in any direct or indirect impacts to a historical resource.

To determine the impacts to historical resources at the Benedict Reservoir site, CRM Tech conducted historical and archeological survey. The results of which are documented in the *Historical/Archeological Resources Survey Report*, (This report is included as Appendix C of this Initial Study.) As part of the survey, a records search was conducted by CRM Tech on December 2018 at the Eastern Information Center (EIC) and the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information Center, located at the University of California, Riverside and California State University, Fullerton, respectively. The EIC and SCCIC are the official cultural resource records repositories for the Counties of Riverside and San Bernardino, respectively. CRM Tech reviewed maps and records on file at the EIC and SCCIC for previously identified cultural resources in or near the Project area and existing cultural resources reports pertaining to the vicinity. Also in the same month, CRM Tech conducted a pedestrian survey in which the Soboba Band of Luiseño Indians' Native American Monitor participated in the fieldwork

A systematic resurvey of the Benedict Reservoir area was deemed necessary for this study and produced negative results for potential historical resources because no buildings, structures, objects, sites, features, or artifacts of prehistoric or historical origin were found within or adjacent to the reservoir area.

Outside of the Benedict Reservoir area boundaries but within a half-mile radius of the reservoir site, the EIC and SCCIC records show at least 26 other previous studies on various tracts of land and linear features. Over half of the land within the scope of the records search has been surveyed, which resulted in the identification of 21 historical/archaeological sites and six isolates. None of these were recorded within or immediately adjacent to the Project area. Among these known cultural resources, 16 sites and four isolates were of prehistoric origin, consisting mainly of bedrock milling features but also including a few clusters of habitation debris. All of them were located one half-mile or more from the reservoir area. The nearest among them, Site 33-003494, represented two bedrock milling features with a total of six grinding slicks, located some 0.55 mile to east. The other five sites and two isolates dated to the historic period and included power transmission lines, a quarry complex, and scattered refuse items. None of the 21 sites and six isolates were found in the immediate vicinity of the reservoir area; thus, none of them require further consideration in connection to the Benedict Reservoir.

The existing 0.21-MG reservoir in the Benedict Reservoir area and the adjacent 1.0 MG reservoir date to 1977 and circa 1990,respectively, do not meet the age threshold to be considered historical in origin (i.e., more than 50 years of age). As common infrastructure features of standard design and construction, these simple steel tanks are utilitarian in character and demonstrate no remarkable architectural, engineering, artistic, or aesthetic qualities. (CRM, p.12.) Based on these findings, CRM Tech concluded that the Project area does not have any potential to qualify as “historical resources,” and thus requires no further consideration under CEQA provisions on cultural resources. Further, the Armstrong Booster Station was constructed in conjunction with the existing reservoirs at the Benedict Reservoir site, therefore the booster station also does not meet the age threshold to be historical in origin. Implementation of the proposed Project will not impact any resource eligible for listing in the California Register of Historic Places. As such, impacts to historic resources are considered to be less than significant.

**5b. Response:** *(Source: CRM Tech)*

**Less Than Significant Impact With Mitigation Incorporated.** As discussed in Response 5a above, none of the 21 historical/archaeological sites and six isolates were recorded within or immediately adjacent to the Project Benedict Reservoir site. The Benedict Reservoir site and the Armstrong Booster Station site have been previously disturbed by the construction of the existing 0.21 MG reservoir, the adjacent 1.0 MG reservoir at the Benedict Reservoir, and the installation of the booster pumps at the Armstrong Booster Station. Given the disturbed and developed nature of the Project site, it is unlikely that archaeological resources will be discovered during construction activities. Nonetheless, mitigation measure **MM CR 1**, which requires the construction in the vicinity of a find be halted until a qualified archaeologist makes a determination as to the significance of the find, will be implemented. Therefore with implementation of mitigation measure **MM CR 1**, potential impacts to archaeological resources would be less than significant.

> **MM CR 1**: In the event that 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, the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI) and the Morongo Band of Mission Indians Tribal Historic Preservation Office (MBMI) shall be contacted, as detailed within mitigation measure MM TCR 1, regarding any pre-contact finds and be provided information after the archaeologist makes his/her initial assessment of the nature of the find, so as to provide Tribal input with regards to significance and treatment.

**MM CR 2**: If significant pre-contact cultural resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, the archaeologist shall develop a Monitoring and Treatment Plan, the drafts of which shall be provided to SMBMI and MBMI for review and comment, as detailed in mitigation measure **MM TCR 1**. The archaeologist shall monitor the remainder of the project and implement the Plan accordingly.

**5c. Response:** *(Sources: California Code of Regulations (CCR) Section 15064.5l; Public Codes of Regulations (PCR) Section 5097.98; Section 7050.5 of the State Health and Safety Code (HSC))*

**Less Than Significant Impact.** The Benedict Reservoir site and the Armstrong Booster site have been previously disturbed by the construction of the existing two water storage reservoirs and the construction of the booster station, respectively. In the unlikely event that unknown human remains are uncovered during Project construction, pursuant to law, the proper authorities will be notified and standard procedures for the respectful handling of human remains will be adhered to in compliance with California Code of Regulations (CCR) Title 14, Chapter 3, Section 15064.5(e), Public Resources Code (PRC) Division 5, Chapter 1.75, Section 5097.98, State Health and Safety Code (HSC) Division 7, Part 1, Chapter 2, Section 7050.5. Compliance with these regulations will reduce potential impacts to human remains to a less than significant.

| **6. Energy** | **Potentially Significant Impact** | **Less Than Significant With Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency | ☐ | ☐ | ☐ | ☒ |

**6.a. Response:** *(Sources: City of Jurupa Valley General Plan 2017 (JVGP); Air Quality/Greenhouse Gas Analysis)*

**Less Than Significant Impact.** The analysis in this section addresses each of the six potential energy impacts identified in Appendix F of the *CEQA Guidelines* and utilizes the assumptions from CalEEMod evaluated in Section 3. Air Quality and Section 10. Greenhouse Gas Emissions, of this Initial Study (IS), respectively.

Appendix F of the *CEQA Guidelines* provides for assessing potential impacts that a project could have on energy supplies, focusing on the goal of conserving energy by ensuring that projects use energy wisely and efficiently. Pursuant to impact possibilities listed in *CEQA Guidelines* Appendix F, an impact with regard to energy consumption and conservation will occur if implementation of the proposed Project will result in the wasteful, inefficient, or unnecessary consumption of energy. Impacts may include:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal;

2. The effects of the project on local and regional energy supplies and on requirements for additional capacity;

3. The effects of the project on peak and base period demands for electricity and other forms of energy;

4. The degree to which the project complies with existing energy standards;

5. The effects of the project on energy resources;

6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

i)The analysis below addresses each of the six potential energy impacts identified in Appendix F of the CEQA Guideline1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal.

The Project, which consists of the construction of water facilities improvements, would not increase the existing maintenance frequency vehicle trips. The additional 30 HP pump at the booster station site will be electric powered. This does not consume a significant amount of energy because it is small and does not run constantly; the pump typically operates during non-peak hours after the water level of the tanks decrease. Thus, the long-term operational energy use from this Project would be negligible and would have a less than significant effect on energy resources.

Project construction would require the use of construction equipment for each of the construction activities identified in Threshold 3b, as well as construction workers and vendors traveling to and from the Project site. Construction equipment requires diesel as the fuel. However, fuel consumed during construction would be temporary in nature and would not

represent a significant demand on energy resources. Construction equipment is also required to comply with regulations limiting idling to five minutes or less (CCR Title 13 § 2449(d)(3)). Furthermore, there are no unusual Project site characteristics that would necessitate the use of construction equipment that would be less energy-efficient than at comparable construction sites in other parts of the State. For comparison, the State of California consumed 15.5 billion gallons of gasoline and 3.1 billion gallons of diesel fuel in 2017, which is the most recent published data.[1]. Thus, the fuel usage during Project construction would account for a negligible percent of the existing gasoline and diesel fuel related energy consumption in the State of California. Furthermore, it is expected that construction-related fuel consumption associated with the Project would not be any more inefficient, wasteful, or unnecessary than at other construction sites in the region.

Based on the limited amount of construction energy consumption and compliance with regulatory programs would ensure that the Project would not result in the inefficient, unnecessary, or wasteful consumption of energy. Therefore impacts to energy resources during construction or operation will be less than significant. No mitigation measures are required.

2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.

The proposed Project is an infrastructure project and will not create a substantial demand for local or regional gas or electricity energy supplies. As previously noted, the Project will replace an existing reservoir and add a third electric pump, thus incrementally increasing energy demand. The Project does not use natural gas. The Project does not add lighting and the additional pump as noted above, does not run constantly; the pump typically operates during non-peak hours. Therefore, impacts to local and regional energy supplies during construction or operation will be less than significant. No mitigation measures are required.

3. The effects of the project on peak and base period demands for electricity and other forms of energy.

As described above, the construction and operation activities of the Project will not substantially affect peak and base period demands for electricity or other forms of energy, such as natural gas, as the Project does not use natural gas. Therefore impacts to local and regional energy supplies during construction or operation will be less than significant. No mitigation measures are required.

4. The degree to which the project complies with existing energy standards.

The proposed Project would comply with state and federal energy conservation measures related to construction and operations. Although many of the regulations regarding energy efficiency are focused on increasing building efficiency and renewable energy generation, promoting sustainability through energy conservation measures, as well as reducing water consumption, this Project will comply with applicable regulations. As such, the construction and

[1] *http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds*

operation activities of the Project will meet and/or exceed these regulatory requirements. No mitigation measures are required.

Through implementation of energy conservation measures and sustainable practices, the Project will not use large amounts of energy in a manner that is wasteful or otherwise inconsistent with adopted plans or policies.

5. The effects of the project on energy resources.

The effects of the Project on energy supplies and resources from a capacity standpoint are described above in the preceding analysis. In regard to the effects of the Project on energy resources, the Project is required to ensure that the Project does not result in the inefficient, unnecessary, or wasteful consumption of energy.

6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

As stated above, energy impacts associated with transportation during construction and operation of the Project would not result in the inefficient, unnecessary, or wasteful consumption of energy through adherence to existing regulations. Since this is a public facilities project, this Project will not impact efficient transportation alternatives.

Taken together, Implementation of the proposed Project will have less than significant impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. No mitigation measures are required.

**6.b. Response**: *(Source: California Energy Code)*

**Less Than Significant Impact With Mitigation Incorporated.** Implementation of the Project will not result in inefficient, unnecessary, or wasteful consumption of energy, as outlined in Threshold 6a. The proposed Project would be required to comply with state and federal energy conservation measures related to construction and operations, as noted above. As such, impacts to obstructing a state or local plan for renewable energy or energy efficiency during construction or operation will be less than significant. No mitigation measures are required

| 7. Geology and Soils | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving | | | | |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | ☐ | ☐ | ☒ | ☐ |
| ii) Strong seismic ground shaking? | ☐ | ☐ | ☒ | ☐ |
| iii) Seismic-related ground failure, including liquefaction? | ☐ | ☐ | ☒ | ☐ |
| iv) Landslides? | ☐ | ☐ | ☒ | ☐ |
| b) Result in substantial soil erosion or the loss of topsoil? | ☐ | ☐ | ☒ | ☐ |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse? | ☐ | ☐ | ☒ | ☐ |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property? | ☐ | ☐ | ☒ | ☐ |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | ☐ | ☐ | ☐ | ☒ |
| f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☐ | ☒ | ☐ |

**7.a.i. Response:** *(Sources: DOC Alquist-Priolo Fault Zone and Seismic Hazard Zone Maps; JCSD Standards Manual for Water and Sewer Facilities (JCSD Manual); JVGP Figure 8–4 − Mapped Fault Zones; Geotechnical Investigation Report)*

**Less Than Significant Impact.** Seismic activity is expected in Southern California; however, the Project is not located within an Alquist-Priolo zone. The Project site does not contain any known fault; therefore, the potential for on-site fault rupture is very low. The closest fault is San Jacinto Fault, located approximately 17 miles southwest from the Project site. Moreover, the Benedict Reservoir and the Armstrong Booster Station would be designed and constructed in conformance with JCSD's Standards Manual for Water and Sewer Facilities, California Waterworks Standards of California Administrative Code Title 22, and California Occupational Safety and Health Administration (Cal-OSHA) safety requirements. These standards and

regulations are designed to reduce construction workers, maintenance worker, and the public's exposure to impacts related to earthquake faults. Additionally, the new reservoir would be designed and constructed in accordance with the recommendations of the *Geotechnical Investigation Report*. Therefore, the potential for substantial adverse impacts resulting from a fault rupture would be less than significant.

**7a.ii. Response:** *(Sources: DOC Alquist-Priolo Fault Zone and Seismic Hazard Zone Map; JCSD Standards Manual for Water and Sewer Facilities; JVGP Figure 8–4 − Mapped Fault Zones; Geotechnical Investigation Report)*

**Less Than Significant Impact.** Nearby fault zones located west, southwest, and northeast of the Project site have the potential to cause moderate earthquakes that would cause intense ground shaking. The new Benedict Reservoir, due its large water holding capacity and general location, at higher elevations than surrounding development, could expose people and/or structures to flooding hazards if ruptured by seismic ground shaking. However the Benedict Reservoir would incorporate applicable AWWA standards which set guidelines for the construction of welded steel water tanks, as well as incorporate measures to accommodate projected seismic loading, pursuant to existing guidelines set forth in the "Greenbook" Standard Specifications for Public Works Construction, the California Building Code, International Building Code, and the recommendations of the *Geotechnical Investigation Report*. These standards and codes provide standard specifications for engineering and construction activities, including measures to accommodate seismic loading parameters. The *Geotechnical Investigation Report* sets forth specific recommendations with for the planning, design, and construction of the proposed reservoir. Moreover, JCSD regularly monitors all water storage facilities for leaks and repairs them to avoid conditions that might result in a failure. The Armstrong Booster Station does not propose any structures, habitable or otherwise, that could pose a substantial risk to people or other structures in the event of strong seismic ground shaking. Both, the proposed new reservoir and the Armstrong Booster Station pump, would be designed and constructed in conformance with JCSD's Standards Manual for Water and Sewer Facilities, California Waterworks Standards of California Administrative Code Title 22, and California Occupational Safety and Health Administration (Cal-OSHA) safety requirements. The reservoir would be designed and constructed in accordance with the recommendations of the *Geotechnical Investigation Report.* For these reasons, the Project's potential to expose seismic shaking impacts to construction workers, maintenance workers, and the public would be to less than significant.

**7a.iii. Response:** *(Sources: JCSD Standards Manual for Water and Sewer Facilities; JVGP Figure 8–5 − Liquefaction Susceptibility in Jurupa Valley; Geotechnical Investigation Report)*

**Less Than Significant Impact.** Liquefaction occurs primarily in saturated, loose, fine- to medium grained soils in areas with a high groundwater table (usually within 50 ft. of subsurface). Shaking can cause the soils to lose strength and liquefy. The Project site is located in an area with moderate potential for liquefaction. The *Geotechnical Investigation Report* concluded that based on the presence of shallow bedrock at the reservoir site, the potential for liquefaction is considered low. (Converse, p. 8.) Further, proper engineering design and

construction in conformance with JCSD's Standards Manual for Water and Sewer Facilities, California Waterworks Standards of California Administrative Code Title 22, Cal-OSHA safety requirements, and the recommendations of the *Geotechnical Investigation Report* would reduce impacts related to seismic-related ground failure, including liquefaction, to less than significant.

**7a.iv. Response:** *(Sources: JCSD Manual; JVGP Figure 8-6 – Landslide Susceptibility in Jurupa Valley; Geotechnical Investigation Report)*

**Less than Significant Impact.** The Benedict Reservoir site on the Jurupa Mountains and the Armstrong Booster station on Armstrong Road are not susceptible to landslides, as shown on Figure 8–6 −Landslide Susceptibility of the JVGP. (JVGP, p.8-7.). The Project sites have been previously excavated, filled, graded, and leveled. As part of the *Geotechnical Investigation Report,* the slopes surrounding the reservoir site were visually inspected and do not show signs of oversteepening or recent landslides. Although the risk of landslides during a large seismic event is not known with certainty, the risk is considered low. (Converse, p. 8.) Therefore impacts with regard to landslides are considered to be less than significant.

**7b. Response:** *(Sources: JCSD Manual)*

**Less Than Significant Impact.** Construction activities associated with the proposed reservoir may result in soil erosion or loss of topsoil. Because construction at the reservoir site is expected to result in the disturbance of more than one acre, pursuant to existing regulatory requirements, the Project would be required to obtain a National Pollutant Elimination System (NPDES) general construction permit from the State Water Resources Control Board and prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to the start of construction activities at the reservoir site. The SWPPP shall incorporate applicable Best Management Practices (BMPs) to reduce loss of topsoil or substantial erosion. Construction at the Armstrong Booster station is not anticipated to result in soil erosion or the loss of topsoil because the area in which construction will take place is paved.

The Project is also be required to comply with JCSD's Standards Manual for Water and Sewer Facilities and California Waterworks Standards of California Administrative Code Title 22. Operation of the proposed Benedict Reservoir and the Armstrong Booster Station would not result in soil erosion or loss of topsoil because once construction is complete at the reservoir site, the area that would be accessed for maintenance will be paved. Additionally, there are existing on-site storm drains at the reservoir site, which reduces the potential for soil erosion and loss of top soil to a less than significant level. Therefore, Project impacts related to soil or loss of topsoil will be less than significant.

**7c. Response:** *(Sources: JCSD Manual; JVGP Figure 8–5 − Liquefaction Susceptibility in Jurupa Valley; JVGP Figure 8-6 – Landslide Susceptibility in Jurupa Valley; Geotechnical Investigation Report)*

**Less Than Significant Impact.** The Project is located on land not typically associated with unstable soil conditions as shown on JVGP Figure 8–5 − Liquefaction Susceptibility in Jurupa Valley and JVGP Figure 8–6 −Landslide Susceptibility in Jurupa Valley. (JVGP, pp. 8-6, 8-7.) The Project site is identified as land with low liquefaction potential and no landslide

susceptibility. Further, the Project would not result in unstable soil. Proper engineering design and construction in conformance with JCSD's Standards Manual for Water and Sewer Facilities, California Waterworks Standards of California Administrative Code Title 22, and California Occupational Safety and Health Administration (Cal-OSHA) safety requirements for both the reservoir and pump station, and incorporation of the recommendations in the *Geotechnical Investigation Report* for the reservoir, would reduce potential impacts related to landslide, lateral spreading, subsidence, liquefaction, or collapse to less than significant.

**7d. Response:** *(Sources: JCSD Manual; JVGPEIR – Figure 4.6.2 Soils – Table 4.6.A Soils within the City of Jurupa Valley; Geotechnical Investigation)*

**Less Than Significant Impact.** Expansive soils expand, or swell, when wet and shrink when dry. The amount or type of clay present in soil determines the shrink-potential. The Project is located in soils identified with a low to moderate shrink-swell, potential (JVGP DEIR, pp. 4.6-5 – 4.6-7). Moreover, the Project will incorporate standard engineering and construction protocols in conformance with JCSD's Standards Manual for Water and Sewer Facilities, California Waterworks Standards of California Administrative Code Title 22, and California Occupational Safety and Health Administration (Cal-OSHA) which will incorporate all adequate and appropriate safety considerations. Additionally, the reservoir will be designed and constructed in accordance with the recommendations of the *Geotechnical Investigation Report*. For these reasons, direct and indirect impacts resulting from construction on expansive soils would be less than significant.

**7e. Response:** *(Source: Project Description)*

**No Impact.** The proposed Project involves the construction and periodic operational maintenance of water facilities and will not require septic tanks or alternative waste water disposal systems. No impacts will occur.

**7f. Response:** *(Source: Project Description)*

**Less Than Significant Impact.** The majority of the Benedict Reservoir and the Armstrong Booster Station have been previously disturbed by the construction of the existing water storage reservoirs and the existing booster pumps, respectively. The majority of the proposed water storage reservoir and access road would be constructed within previously disturbed areas of the Reservoir site and the booster pump would be constructed within the paved Armstrong Booster Station site. Therefore, given the disturbed and developed nature of the Project site it is unlikely that paleontological resources would be discovered during construction activities. As such, impacts are considered to be less than significant.

| 8. Greenhouse Gas Emissions | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | ☐ | ☐ | ☒ | ☐ |

**8a. Response:** *(Sources: SCAQMD Greenhouse Gas CEQA Significance Threshold (SCAQMD-D); SCAQMD CEQA Draft Guidance Documents (SCAQMD-E); Air Quality/Greenhouse Gas Analysis)*

**Less Than Significant Impact.** Greenhouse gases (GHG) are not presented in pounds per day (lbs/day) like criteria pollutants; they are typically evaluated on an annual basis using the metric system. Several agencies, at various levels, have proposed draft GHG significance thresholds for use in CEQA documents. SCAQMD has been working on GHG thresholds for development projects. In December 2008, the SCAQMD adopted a threshold of 10,000 metric tonnes per year of carbon dioxide equivalents ($MTCO_2E$/yr) for stationary source projects where SCAQMD is the lead agency. The most recent draft proposal was in September 2010 and included screening significance thresholds for residential, commercial, and mixed-use projects at 3,500, 1,400, and 3,000 $MTCO_2E$/yr, respectively. Alternatively, a lead agency has the option to use 3,000 $MTCO_2E$/yr as a threshold for all non-industrial projects. Although both options are recommended by SCAQMD, a lead agency is advised to use only one option and to use it consistently. The SCAQMD significance thresholds also recommends amortizing construction emission over an expected project life of 30 years.

The CalEEMod model calculates GHG emissions from fuel usage by construction equipment and construction-related activities, like construction worker trips, for the Project. The CalEEMod estimate does not analyze emissions from construction-related electricity or natural gas. Construction-related electricity and natural gas emissions vary based on the amount of electric power used during construction and other unknown factors which make them too speculative to quantify. The CalEEMod output results for construction-related GHG emissions provide for carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), and carbon dioxide equivalent ($CO_2E$) as shown in **Table 8 – Project Construction Equipment GHG Emissions** below:

**Table 8 − Project Construction Equipment GHG Emissions**

| Year | Metric Tons per Year (MT/yr) | | | |
|---|---|---|---|---|
| | Total $CO_2$ | Total $CH_4$ | Total $N_2O$ | Total $CO_2E$ |
| 2020 | 240.31 | 0.05 | 0.00 | 241.45 |
| **Total** | | | | **241.45** |
| | | | **Amortized[1]** | **8.05** |

| Year | Metric Tons per Year (MT/yr) | | | |
|---|---|---|---|---|
| | Total $CO_2$ | Total $CH_4$ | Total $N_2O$ | Total $CO_2E$ |
| 2020 | 240.31 | 0.05 | 0.00 | 241.45 |

Source: Appendix A – Air Quality/Greenhouse Gas Analysis
Note: [1]Construction emissions were amortized over a 30 year period, as recommended by SCAQMD.
GHG – Greenhouse Gases, $CO_2$ – carbon dioxide, $CH_4$- methane, $N_2O$ – nitrous oxide, $CO_2E$ – carbon dioxide equivalent

**Table 8** indicates that an estimated total of 241.5 $MTCO_2E$ per year will occur from Project construction equipment over the course of the estimated 12-month construction period. The draft SCAQMD GHG threshold guidance document released in October 2008 recommends that construction emissions be amortized for a project lifetime of 30 years to ensure that GHG reduction measures address construction GHG emissions as part of the operational reduction strategies.

The proposed Project does not fit into the categories provided (industrial, commercial, and residential) in the draft thresholds from SCAQMD. The Project's emissions were compared to the 3,000 MTCO2E/yr threshold for non-industrial projects. Since the draft SCAQMD GHG threshold guidance document released in October 2008 (SCAQMD 2008b, p. 3-8) recommends that construction emissions be amortized for a project lifetime of 30 years to, the total GHG emissions from Project construction were amortized and are below the SCAQMD recommended screening level of 3,000 MTCO2E/yr. Due to the lack of adopted emissions thresholds, the estimated amount of emissions from Project construction and negligible operational emissions from infrequent maintenance vehicles related to the reservoir and booster station improvements, the proposed Project will not generate GHG emissions that exceed the screening threshold..

Due to the estimated amount of emissions from Project construction, and negligible operational emissions from infrequent maintenance vehicles, the proposed Project will not generate GHG emissions and the impact is considered to be less than significant. No mitigation is required.

**8b. Response:** *(Source: Appendix A – Air Quality/Greenhouse Gas Analysis)*

**Less Than Significant Impact.** As the proposed Project involves the construction of public utility improvements, it is not considered a significant source of operational GHG emissions. The Project will not result in any changes to the existing land use patterns within the Project area and its construction does not generate significant amounts of GHG (refer to **Table 8**); therefore, the Project will not conflict with any applicable plan, policy, or regulation for the reduction in GHG emissions. Impacts are considered to be less than significant. No mitigation is required.

| **9. Hazards/Hazardous Materials** | **Potentially Significant Impact** | **Less Than Significant With Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☐ | ☐ | ☒ | ☐ |

| 9. Hazards/Hazardous Materials | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☐ | ☐ | ☒ | ☐ |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter-mile of an existing or proposed school? | ☐ | ☐ | ☐ | ☒ |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | ☐ | ☐ | ☐ | ☒ |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |
| f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☒ | ☐ |
| g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? | ☐ | ☐ | ☒ | ☐ |

**9a. Response:** *(Sources: California Code of Regulations (CCR) Title 13 Sections 1160-1167; Code of Federal Regulations (CFR) Title 49 Parts 171-180)*

**Less Than Significant Impact.** Construction of the Project will involve the transport of fuels, lubricants, and various other liquids for operation of construction equipment. These materials will be transported to the Benedict Reservoir site and Armstrong Booster Station site by equipment service trucks. In addition, workers will commute to the Project via private vehicles and will operate construction vehicles and equipment on public streets. The United States Department of Transportation Office of Hazardous Materials Safety prescribes strict regulations for the safe transport of hazardous materials, as described in Code of Federal Regulations Title 49 and implemented by California Code of Regulations Title 13. Materials that are hazardous to humans and animals will be present during Project construction including diesel fuel, gasoline, equipment fuels, concrete, lubricant oils, and adhesives.

The Project involves the construction and operation of potable water storage reservoir and booster pump, as well as the demolition of the 0.21 MG reservoir. Operation of the Project does not include routine transport or disposal of hazard material

The potential exists for direct impacts to human health and the environment from accidental spills of small amounts of hazardous materials during Project construction through the transport, use, and disposal of construction-related hazardous materials such as fuels, lubricants, and solvents. However, a variety of federal, state, and local laws govern the transport, generation, treatment, and disposal of hazardous materials and wastes. Title 49, parts 171-180 of the Code of Federal Regulations (CFR) implemented by Title 13, Sections 1160-1167 of the California Code of Regulations (CCR), for instance, regulates the safe transportation of hazardous materials and appropriate documentation for all hazardous waste that is transported is required. Construction activities, including the demolition of the 0.21 MG reservoir will comply with the guiding regulations. Save for the materials to be used on site during operation, the presence of a number of hazardous materials will cease upon completion of construction, and will not be necessary during operation except for additional maintenance or emergency-repair activities. Compliance with all applicable laws and regulations will reduce potential impacts associated with routine transport, use, or disposal of hazardous materials. Therefore, regarding the presence of hazardous materials, the Project's impacts will be less than significant. No mitigation is required

**9b. Response:** *(Source: Code of Federal Regulations (CFR) Title 49 Parts 171-180)*

**Less Than Significant Impact.** Given the size of Project and the types of hazardous materials needed during construction and operation, hazardous materials on site would not be present in any significant quantity and any spill is likely to be easily contained. Moreover, use of these materials will be conducted in accordance with all applicable federal and state laws, which includes requirements for secondary containment of hazardous materials and appropriate spill response procedures. Therefore, regarding release of hazardous materials, impact would be less than significant.

**9c. Response:** *(Source: JUSD)*

**No Impact.** The Project site is within the Boundaries of the Jurupa Unified School District (JUSD), however there are no schools within a one-quarter mile from the Project site. The closest existing school is Nueva Vista Continuation High School, which is 0.65 miles southwest of the Project. As such, no impacts would occur.

**9d. Response:** *(Sources: DTSC EnviroStor; JVGP)*

**No Impact.** No hazardous materials sites are listed in the Department of Toxic Substances Control (DTSC) EnviroStor Hazardous Waste and Substances Site List (Cortese). The DTSC's EnviroStor data management system for tracking cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known contamination does not identified cases near the Project site within one mile radius. The proposed Project is not located on an identified as a hazardous waste sites. As such, no impacts will occur.

**9e. Response:** *(Sources: JVGP Figure 2-31 – Airport Safety Zones; Flabob and Riverside Airports)*

**No Impact.** The Project site is located approximately 5.1 and 2.40 miles north east of Riverside Municipal Airport and Flabob Airport, respectively. The Project is outside both airports' compatibility zone and noise contours, as shown on JVGP Figure 2-31 – Airport Safety Zones. (JVGP, p. 2-68.) The Project does not entail a use for human occupancy, and minimal workers will be on site during short-term construction activities and maintenance operations of the proposed improvements. Further, the water reservoir and pump improvements would not increase the frequency of maintenance visits already occurring. As such, no impacts would occur**.**

**9f. Response:** *(Source: City of Jurupa Valley Traffic Engineering)*

**Less Than Significant Impact.** Project construction will be confined to the Benedict Reservoir site located within the Jurupa Mountains and at the Armstrong Booster Station site. The Project will not require lane closures. Further, as infrastructure project, implementation would not interfere with an adopted response plan or emergency evacuation plan. As such, impacts are considered to be less than significant with mitigation incorporated.

**9g. Response:** *(Source: JVGP Figure 8-–0 − Wildfire Severity Zones in Jurupa Valley; PRC)*

**Less Than Significant Impact.** The Project is located in area designated as a fire hazard. The Benedict Reservoir site is located within a very high fire hazard area and the Armstrong Booster Station Is located within a moderate fire hazard area, as shown on JVGP Figure 8-10 Wildfire Severity Zones in Jurupa Valley.

As the Project consists of construction and operation of a water reservoir, a booster pump, and appurtenances, the Project will not expose people to a significant risk of loss, injury, or death from wildland fires. These facilities are not habitable, and, once construction is complete, people will be on site infrequently and for short durations. These facilities will be constructed in areas where existing development is located and will present no additional fire risk to these existing structures, nor are these proposed facilities likely to cause fires and do not consist of prohibited activities pursuant to Public Resources Code (PRC) Sections 4421-4446. Moreover, the Project will not directly or indirectly induce population growth in fire-prone areas. Therefore, the Project's impacts with regard to wildlife fire hazards will be less than significant. No mitigation is required.

| **10. Hydrology and Water Quality** | **Potentially Significant Impact** | **Less Than Significant With Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade surface or ground water quality? | ☐ | ☐ | ☒ | ☐ |

| 10. Hydrology and Water Quality | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin? | ☐ | ☐ | ☒ | ☐ |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would: | | | | |
| (i) result in substantial erosion or siltation onsite or offsite; | ☐ | ☐ | ☒ | ☐ |
| (ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; | ☐ | ☐ | ☒ | ☐ |
| (iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or | ☐ | ☐ | ☒ | ☐ |
| (iv) impede or redirect flood flows? | ☐ | ☐ | ☒ | ☐ |
| d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? | ☐ | ☐ | ☒ | ☐ |
| e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | ☐ | ☐ | ☐ | ☒ |

**10a. Response:** *(Sources: JCSD Manual; County of Riverside Department of Environmental Health; California Department of Public Health)*

**Less Than Significant Impact.** Construction of the proposed Project may result in the discharge of sediment and other construction byproducts. The proposed Project lies within the Jurupa Valley a permittee for the Riverside County NPDES permit issued by the State Water Resources Control Board via the Santa Ana Regional Water Quality Control Board, and are bound to comply with all aspects of the permit requirements. JCSD is the Project's proponent and, although not a permitee to the Riverside County NPDES, will comply with the NPDES permit requirements.

The NPDES permit requires that an erosion control plan be implemented during construction activities with applicable BMPs being implemented to minimize the loss of soil and prevent substantial erosion. The erosion control plan will ensure potential impacts are not significant. In the unlikely event groundwater is encountered during Project construction, a dewatering permit will be required from the State Water Resources Control Board, and this permit will identify waste discharge requirements and water quality objectives that must be achieved. The reservoir component of the Project is required to prepare a SWPPP in order to comply with the California

General Permit for Stormwater Discharges Associated with Construction Activity. The focus of a construction SWPPP is to manage soil disturbance, non-stormwater discharges, construction materials, and construction wastes during the construction phase of the Project to prevent discharge of polluted runoff from the construction site. Furthermore, the proposed Project entails potable water facilities and is subject to all requirements of the County of Riverside Department of Environmental Health and the California Department of Public Health, whichever is more restrictive. As such, impacts are considered to be less than significant.

**10b. Response:** *(Source: Project Description)*

**Less Than Significant Impact.** The Project entails the construction of a water storage reservoir and a booster pump, which do not propose the extraction of groundwater. The Project will store and transport existing potable water supplies for JCSD. Because Project implementation will not substantially deplete groundwater supplies or interfere with groundwater recharge, impacts are less than significant.

**10c.i –10c.iv. Response:** *(Source: Project Description)*

**Less Than Significant Impact.** Impervious surface area will be added at the Benedict Reservoir site to accommodate the 1.1 MG water storage reservoir and the relocated access road. The amount of impervious surface area will be added is approximately 0.23 acres, which would not substantially alter existing drainage patterns. Further, the existing stormdrain, a portion of which, will be relocated southeast to accommodate the proposed 1.1 MG reservoir, will continue to collect the reservoir site's stormwater runoff. No new impervious surface area will be added at the Armstrong Booster Station site, which is already paved except for a landscaped area along the street frontages. Thus, implementation of the proposed Project will not substantially alter existing drainage patterns resulting in substantial erosion or siltation. Impacts would be less than significant.

**10d. Response:** *(Sources: Project Description; JVGP Figure 8-9 Flood Insurance Rate Map)*

**Less Than Significant Impact.** The Project is not located in a flood hazard zone as shown on JVGP Figure 8-9 Flood Insurance Rate Map. (JVGP, p. 8-12.) The Project site is not located in an area that would be likely to be subject to seiche or tsunamis. Seiche is a back and forth vibration of water which can be caused by wind or seismic activities. The most likely area that could be subject to seiche is around Lake Mathews, a large body of water, located approximately 12 miles south of the Project. Tsunamis are tidal waves that occur in coastal areas. The Project is located approximately 40 miles northeast of the Pacific Ocean. Therefore, since the Project is not within a flood hazard, tsunamis, or seiche zone, impacts will be less than significant.

**10e. Response:** *(Source: Project Description)*

**No Impact.** The reservoir component of the proposed Project entails replacing the existing 0.21 MG potable water reservoir at the Benedict Reservoir site with a new 1.0 MG potable water reservoir, relocating portions of an existing access road and fence, and adding a third pump and

associated electrical connections at the Armstrong Booster Station site. Since the Project is constructing water facilities to accommodate growth consistent with the JCSD 2015 UWMP, construction and operation of the Project will not obstruct the implementation of a water quality control plan or sustainable groundwater management plan. No impacts will occur. No mitigation is required.

| 11. Land Use and Planning | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project**: | | | | |
| a) Physically divide an established community? | ☐ | ☐ | ☐ | ☒ |
| b) Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | ☐ | ☐ | ☒ | ☐ |

**11a. Response:** *(Sources: Project Description; JVGP Figure 2-5 – 2017 General Plan Land Use Plan)*

**No Impact.** Implementation of the Project would not divide an established community; the proposed 1.1 MG water storage reservoir and the booster pump will be constructed at the same location as existing facilities. The new 1.1 MG water storage reservoir, which will replace an existing 0.21 MG reservoir will be constructed on the Benedict Reservoir site, on the hillside, adjacent to an existing residential community. The new pump would be constructed in the proposed extension of the existing steel structure at the Booster Station site. As such, the proposed facilities will not divide an established community and no impacts will occur.

**11b. Response:** *(Source: JVGP Figure 2-5 – 2017 General Plan Land Use Plan)*

**Less than Significant Impact.** The Project's proposed 1.1 MG reservoir and booster pump are within an area designated by the JVGP as Open Space –Rural (OS-RUR) and Low Density Residential (LD–) - Country Neighborhood, respectively, and both facilities are within the Equestrian Lifestyle Protection Overlay (ELO) designation. The JVGP contains policies for the provision of water service, and since the Project are improvements to exisiting water facilities, implementation of the proposed Project will not conflict with any applicable land use plan, policy, or regulation. As such, no impacts will occur. No mitigation is required.

| 12. Mineral Resources | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☒ | ☐ |
| b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | ☐ | ☐ | ☐ | ☒ |

**12a. Response:** *(Sources: JVGP Figure 4-16 – Jurupa Valley Mineral Resources; Project Description)*

**Less Than Significant Impact.** As shown on JVGP Figure 4-16 – Jurupa Valley Mineral Resources, the Benedict Reservoir and Armstrong Booster Station sites are within MRZ-3 zone, which is an area containing known or inferred mineral occurrences of undetermined mineral resource significance. However, given the relatively small footprint of the proposed Project facilities and the amount of existing development in the immediate area, it is highly unlikely that any surface mining or mineral recovery operation could feasibly take place in these areas. Therefore, impacts with regard to the loss of availability of a known mineral resource are considered to be less than significant.

**12b. Response:** *(Source: JVGP Figure 4-16 – Jurupa Valley Mineral Resources)*

**No Impact.** There are no locally-important mineral resources at either the reservoir site or the Armstrong Booster Station site. (JVGP EIR, p. 4-11-7.) Therefore, no impacts will occur. No mitigation is required.

| 13. Noise | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project result in:** | | | | |
| a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☐ | ☐ | ☐ |
| b) Generation of excessive groundborne vibration or groundborne noise levels? | ☐ | ☐ | ☐ | ☐ |
| c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☐ | ☒ |

**13a. Response:** *(Sources: Project Description; City of Jurupa Valley Chapter 11.05 – Noise Regulations)*

**Less Than Significant Impact.** Construction of the proposed Project will generate noise during construction from equipment used at the reservoir site, booster station site, and construction vehicles using local streets, some of which are within residential neighborhoods. Since both the reservoir site and booster station site are within Jurupa Valley, the applicable standards are set forth in the Jurupa Valley Municipal Code. According to Chapter 11.05, Section 11.05.020 of the Jurupa Valley Municipal Code, noise emanating from capital improvement projects of a governmental agency, maintenance or repair of public properties, and motor vehicles, other than off-highway vehicles are exempt from the Noise Regulations. Since the proposed Project is a capital improvement project that will be constructed and operated by JCSD, Project-generated construction noise as well as noise from construction vehicles are exempt from Jurupa Valley's Noise Ordinance and Regulations. Once Project facilities are installed, operational noise impacts would be limited to periodic repair and maintenance. As such, impacts are considered to be less than significant. No mitigation is required.

**13b. Response:** *(Source: Project Description; geotechnical Investigation Report)*

**Less Than Significant Impact with Mitigation Incorporated.** The Jurupa Valley Municipal Code does not contain standards with regard to groundborne vibration or groundborne noise. The JVGP Noise Element contains policies with regard to land use compatibility and the protection of sensitive receptors from vibration; however, there are no JVGP Goals, Policies, or Programs that address construction-related vibration. Construction of the proposed reservoir will require construction within bedrock. Therefore, the use of specialized equipment or techniques, such as hydraulic hammers ("breakers') jackhammers, heavy-duty excavators with suitable rippers, or nonexplosive rock reduction methods such as expansive grouts, should be anticipated. (Converse, p. 5.) In keeping with the recommendations of the *Geotechnical Investigation Report*, the specific excavation equipment used will be determined by an experienced earthwork contractor. In addition to the previously identified equipment, excavation of the reservoir site may require blasting. Any blasting conducted in connection with this Project shall be conducted by an appropriately licensed blasting contractor, after preparation of a blasting plan to be approved by JCSD, and securing the necessary permits. If required, blasting activities will be short in duration and will not be employed throughout the entire construction period. Although such noise occurrences are very short, they can cause concern from residents in the vicinity that are unaware that construction activities are the cause of the associated noise or vibration. Therefore, mitigation measure **MM NOISE 1** will be implemented to inform local residents of the blasting occurrences and when they are anticipated.

> **MM NOISE 1**: Although blasting does not exceed any noise standards because its duration is so short, as a courtesy to adjacent residents, JCSD or its designee shall notify residences within one-quarter (1/4) of a mile of the Benedict Reservoir site as to the timing and duration of any potential blasting activities associated with the reservoir site. Notification shall take place between a minimum of five (5) and a maximum of ten (10) working days prior to anticipated blasting activities.

Construction of the pump station and operation of the reservoir and pump station will not generate groundborne vibration or noise. With implementation of mitigation measure **MM NOISE 1**, impacts would be reduced to less than significant. .

**13c. Response:** *(Sources: Project Description; Riverside County Airport Land Use Commission (ALUC))*

**No Impact.** The closest airport to the Project site is Flabob Airport, approximately 2.46 miles south of the Project. According to the Airport Land Use Compatibility Plan prepared by Riverside County Airport Land Use Commission, the Project site is outside the Flabob Airport's influence area. As such, implementation of the Project would not result in a safety hazard or excessive noise for hazard for people residing or working in the Project site. No impact would occur and no mitigation measures are required.

| **14. Population and Housing** | **Potentially Significant Impact** | **Less Than Significant With Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through the extension of roads or other infrastructure)? | ☐ | ☐ | ☒ | ☐ |
| b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |

**14a. Response:** *(Source: Project Description)*

**Less Than Significant Impact.** The Project's purpose is to meet JCSD's 1200 Pressure Zone's current and future potable water storage capacity by replacing a 0.21 MG water storage reservoir with a 1.1 MG reservoir and by adding a third booster pump to Armstrong Booster station. These facilities have been sized to accommodate development and population growth within the 1200 Pressure Zone consistent with the land use policy and guidance documents of Jurupa Valley. Although temporary employment opportunities may be created during construction of the Project facilities, this will not induce substantial population growth in Jurupa Valley or Western Riverside County as there exists an ample and available regional labor force. Therefore, the Project will not result in direct or indirect unplanned population growth. As such, impacts are considered to be less than significant.

**14b. Response:** *(Source: Project Description)*

**No Impact.** Project construction and operation will not necessitate the demolition or relocation of existing housing units. Since no housing will be displaced, no people will be displaced as a result of Project implementation, no impacts will occur.

| 15. Public Services | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| ii) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services | | | | |
| a) Fire protection? | ☐ | ☐ | ☐ | ☒ |
| b) Police protection? | ☐ | ☐ | ☐ | ☒ |
| c) Schools? | ☐ | ☐ | ☐ | ☒ |
| d) Parks? | ☐ | ☐ | ☐ | ☒ |
| e) Other public facilities? | ☐ | ☐ | ☐ | ☒ |

**15a. Response:** *(Source: Project Description)*

**No Impact.** As discussed in Threshold 14a above, the Project will not directly or indirectly generate new development or persons to Jurupa Valley. As such, the Project does not necessitate the construction of new governmental facilities or increase the demand for fire protection services in Jurupa Valley. No impacts will occur.

**15b. Response:** *(Source: Project Description)*

**No Impact.** As noted in Thresholds 14a and 15a above, the Project would not directly or indirectly generate new development or persons to Jurupa Valley. Therefore, the Project will not increase the demand for police protection services in the City and no impacts will occur.

**15c. Response:** *(Source: Project Description)*

**No Impact.** As noted in Thresholds 14a and 15a above, the Project will not increase the demand for school services in the Jurupa Unified School District, where the Project facilities are located. No impacts will occur.

**15d. Response:** *(Source: Project Description)*

**No Impact.** As noted in Responses 14a and 15a above, the Project will not increase the demand for new park facilities or increase demand for park services. No impacts will occur.

**15e. Response:** *(Source: Project Description)*

**No Impact.** As noted in Thresholds 14a and 15a above, the Project will not increase the demand on other public services or facilities. No impacts will occur.

| 16. Recreation | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would/does the project:** | | | | |
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☐ | ☒ |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? | ☐ | ☐ | ☐ | ☒ |

**16a. Response:** *(Source: Project Description)*

**No Impact.** As discussed in Threshold 15d above, the Project will not increase the use of existing neighborhood and regional parks or recreational facilities. No impacts will occur.

**16b. Response:** *(Source: Project Description)*

**No Impact.** The Project does not include recreational facilities and as noted in Threshold 15d above, the Project will not result in a need for construction or expansion of recreational facilities. No impacts will occur.

| 17. Transportation | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)? | ☐ | ☐ | ☐ | ☒ |
| c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☐ | ☒ |
| d) Result in inadequate emergency access? | ☐ | ☐ | ☐ | ☒ |

**17a. Response:** *(Sources: Project Description; JVGP Figure 3-17 – Generalized Equestrian Trails Plan)*

**Less Than Significant Impact.** The Project will not alter the existing roadways' configurations or geometrics. The water reservoir and booster pump will be improvements to the existing water facilities and will be constructed in the same site as the existing facilities. Underground pipes connections will be either within the Benedict Reservoir or Armstrong Booster Station sites.

Construction and maintenance operations of the Project will not require lane closures or pedestrian facilities. No new traffic will be generated by the proposed Project. The project will not significantly alter the City's transit roadway, bicycle, pedestrian, and equestrian facilities. Therefore, impacts will be less than significant.

**17b. Response:** *(Sources: Project Description; CEQA Guidelines)*

**No Impact.** Section 15064.3 of the CEQA Guidelines indicates that vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts. However the construction of the new water facilities at the same site location of the existing facilities will not increase VMTs. As such no impacts would occur. No mitigation is required.

**17c. Response:** *(Source: Project Description)*

**No Impact.** The Project will not result in changes to the existing roadway configurations and geometrics. The Project does not include any component that will result in an incompatible use of the existing roadways. Therefore, implementation of the proposed Project will not result in a substantial increase in hazards. No impacts will occur. No mitigation is required.

**17d. Response:** *(Source: Project Description)*

**Less Than Significant Impact.** Operation of the proposed Project will not impact emergency access as the Project will construct a water storage reservoir and booster pump within the Benedict Reservoir site and the Armstrong Booster Station site. As such, impacts are considered to be less than significant. No mitigation is required.

| 18. Tribal Cultural Resources | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| iii)a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that isi) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or | ☐ | ☒ | ☐ | ☐ |
| ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivisil(c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivIon (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | ☐ | ☒ | ☐ | ☐ |

**18a(i) – (ii). Response:** *(Sources: Assembly Bill (AB) 52 Consultation; CRM Tech)*

**Less Than Significant Impact With Mitigation Incorporated.** JCSD provided "Notification of Consultation Opportunity" letters dated April 11, 2019 pursuant to AB 52 to Tribes that have previously requested such a notice. Letters were sent from JCSD to two tribes: Morongo Band of Mission Indians (MBMI) and San Manuel Band of Mission Indians (SMBMI) and JCSD consulted with both tribes.

Although, as discussed in Threshold 5a above, there are no resources listed or eligible for listing in the California Register of Historic Resources, the records search completed as part of the *Historical/Archaeological Resources Survey Report for the 0.21 MG Benedict Reservoir Replacement Project* identified 20 prehistoric sites and isolates located within a one-mile radius of the reservoir site; however all of these sites and isolates are located more than one-half mile away from the reservoir site. As a result of the AB 52 consultation process, in addition to mitigation measures **MM CR 1** and **MM CR 2** (refer to Section 5. Cultural Resources), the Project will implement mitigation measures **MM TRC 1** and **MM TRC 2**, which requires notification and coordination with SMBMI and MBMI in the event of a find.

> **MM TCR 1**: The San Manuel Band of Mission Indians Cultural Resources Department (SMBMI) and the Morongo Band of Mission Indians Tribal Historic Preservation Office (MBMI) shall be contacted, as detailed in CR-1, of any pre-contact cultural resources discovered during project implementation, and be provided information regarding the nature of the find, so as to provide Tribal input with regards to significance and treatment. Should the find be deemed significant, as defined by CEQA (as amended, 2015), a cultural resources Monitoring and

Treatment Plan shall be created by the archaeologist, in coordination with SMBM and MBMI, and all subsequent finds shall be subject to this Plan. This Plan shall allow for a monitor to be present that represents SMBMI or MBMI, as agreed to by the Tribes, for the remainder of the project, should SMBMI or MBMI elect to place a monitor on-site.

**MM TCR 2**: Any and all archaeological/cultural documents created as a part of the project (isolate records, site records, survey reports, testing reports, etc.) shall be supplied to the Lead Agency for dissemination to SMBMI and MBMI. The Lead Agency shall, in good faith, consult with SMBMI and MBMI throughout the life of the project.

With implementation of mitigation measures **MM TCR 1** and **MM TCR 2**, impacts with regard to tribal cultural resources will be reduced to less than significant.

| **19. Utilities and Service Systems** | **Potentially Significant Impact** | **Less Than Significant With Mitigation Incorporated** | **Less Than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| **Would the project:** | | | | |
| a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | ☐ | ☐ | ☒ | ☐ |
| b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? | ☐ | ☐ | ☒ | ☐ |
| c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments? | ☐ | ☐ | ☐ | ☒ |
| d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | ☐ | ☐ | ☒ | ☐ |
| e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | ☐ | ☐ | ☒ | ☐ |

**19a. Response:** *(Source: Project Description)*

**Less Than Significant.** The Project is the construction and maintenance of water facilities to serve JCSD's 1200 Pressure Zone to meet current and future potable water storage needs. The Project will not result in the generation of wastewater and thus will not require new or expanded wastewater treatment facilities. With regard to construction-phase stormwater runoff, the Project

will be subject to the requirements of an effective SWPPP to minimize the discharge of non-stormwater runoff to the maximum extent practicable. The Project's construction and operation will not require construction or relocation of electrical power, natural gas, or telecommunication facilities. A portion of the existing stormdrain at the Benedict Reservoir site will be relocated to accommodate the new reservoir, however no other stormwater drainage features are required to accommodate the new reservoir. For these reasons, impacts will be less than significant.

**19b. Response:** *(Sources: Project Description; 2016 Study)*

**Less Than Significant Impact.** The Project includes the construction of a water storage reservoir and booster pump facilities to meet JCSD's current and future potable water storage needs and pumping capacity. The Project does not propose growth that was not accounted for in the JCSD's 2015 Urban Water Management Plan. As such, impacts are considered to be less than significant.

**19c. Response:** *(Source: Project Description)*

**No Impact.** The proposed Project will not generate wastewater. Rather, the Project is designed to upgrade JCSD's Benedict Reservoir and Armstrong Booster Station facilities to meet the JCSD current and future potable water demands. As such, no impacts will occur.

**19d. Response:** *(Sources: Assembly Bill 939; City of Jurupa Valley Draft 2017 GP; CalRecycle)*

**Less Than Significant Impact.** Construction of the Project and the demolition of the existing 0.21 MG water storage reservoir will not present the potential to generate significant volumes of solid waste. The demolition of the existing tank will generate approximately 100,000 pounds, or 50 tons of waste. Since the location of the disposal landfill is unknown at this time, it is reasonable to anticipate the waste generated from the demolition would be taken to the nearest permitted landfill: Badlands, El Sobrante, or Lamb Canyon. The Badlands Landfill on Ironwood Avenue in Moreno Valley, has a permitted daily capacity of 4,800 tons per day; El Sobrante Landfill on Dawson Canyon Road in Corona, has a permitted daily capacity of 16,054 tons per day; and Lamb Canyon Landfill on State Highway 79 in Beaumont, has a permitted capacity of 5,000 tons per day. (CalRecycle.) Thus the amount of waste generated can be accommodated at any of these landfills. Furthermore, the Project is not a use that generates operational solid waste. Therefore, the Project's impacts will be less than significant. No mitigation is required.

**19e. Response:** *(Sources: Assembly Bill 939; JCSD's Standards Manual for Water and Sewer Facilities)*

**No Impact.** Assembly Bill 939 mandates the reduction of solid waste disposal in landfills by requiring a minimum 50 percent diversion goal. The proposed Project must comply with waste disposal requirements outlined in JCSD's Standards Manual for Water and Sewer Facilities. As such, the proposed Project will not conflict with any Federal, State, or local regulations related to solid waste. No impacts will occur.

| 20. Wildfire | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:** | | | | |
| a. Substantially impair an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☒ | ☐ |
| b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | ☐ | ☐ | ☒ | ☐ |
| c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | ☐ | ☐ | ☒ | ☐ |
| d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? | ☐ | ☐ | ☒ | ☐ |

**20a. Response:** *(Sources: Project Description; JVGP – Figure 8-10 − Wildfire Severity Zones in Jurupa Valley)*

**Less than Significant Impact.** The Benedict Reservoir site is located within the State Responsibility Area (SRA) in a designated very high fire hazard area; the Armstrong Booster Station is located within the SRA in a designated moderate fire hazard area, as shown on JVGP Figure 8-10 Wildfire Severity Zones and on the California Department of Forest Fire Protection Map. Road closures would not occur at the Benedict Reservoir site, as the site has an access road to the site and would allow construction and maintenance crew access. All work associated with the new pump at the Armstrong Booster Station site will take place on that site. Because the project will not entail any road closures, impacts to impairing an adopted emergency response plan or emergency evacuation plan are considered to be less than significant.

**20b. Response:** *(Source: Project Description)*

**Less than Significant Impact.** Implementation of the proposed Project does not include any component that will substantially change the slope of either the Benedict Reservoir site or the Armstrong Booster Station site or exacerbate wildfire risks. Because the Project entails improvements at locations with existing facilities, which are currently maintained by JCSD staff, Project implementation will not result in an increased exposure to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire. For these reasons, impacts are less than significant.

**20c. Response:** *(Sources: JVGP GP Figure 8-10 − Wildfire Severity Zones in Jurupa Valley)*

**Less Than Significant Impact.** The construction and maintenance operations of the Project will not result in the installation or maintenance of roads, fuel breaks, emergency water sources,

power lines, or other utilities. The Benedict Reservoir component will entail slight modification of the access road to accommodate the new reservoir; however, this modification will not exacerbate fire risks or result in significant impacts to other resources. Therefore, the Project's impacts will be less than significant. No mitigation is required.

**20d. Response:** *(Source: Project Description)*

**Less than Significant Impact.** The proposed Project, a water reservoir and booster pump facilities, would not change existing drainage patterns. Construction of the new 1.1 MG Benedict Reservoir, which is replacing the existing 0.21 MG reservoir, will entail grading; however, the reservoir and it associated earthwork has been designed such that any runoff will be captured in an existing storm drain. For these reasons impacts related to flooding or landslide would be less than significant. The Armstrong Booster Station site is in a developed residential neighborhood, which is relatively flat; therefore, construction of a new pump at that location will not cause downstream or downslope flooding, or landslide. Therefore impacts with regard to exposing people or structures to significant risk including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes, will be less than significant

| 21. Mandatory Findings of Significance | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **Does the project:** | | | | |
| a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | ☐ | ☒ | ☐ | ☐ |
| b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? | ☐ | ☒ | ☐ | ☐ |
| c. Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☒ | ☐ | ☐ |

**21a. Response:** *(Source: Above Environmental Checklist; Biological Resources Technical Report, California and Historical/Archaeological Resources Survey Report)*

**Less Than Significant with Mitigation Incorporated.**

*Potential to Degrade Quality of Environment*
The proposed Project would not have the potential to degrade the quality of the environment. As indicated in the foregoing analysis, either no impacts, less than significant impacts, or less than significant impacts with mitigation incorporated would occur with respect to each to the environmental issues analyzed in this Initial Study.

*Potential to Impact Biological Resources*
As discussed in Section 4. Biological Resources, implementation of the proposed Project would not:

- substantially reduce the habitat of a fish or wildlife species;
- cause a fish or wildlife population to drop below self-sustaining levels; or
- threaten to eliminate a plant or animal community.

The results of the *Biological Resources Technical Report* and the *Coastal California Gnatcatcher United States Fish and Wildlife Service Focused Surveys,* and the analysis in Threshold 4a indicate that with implementation of mitigation measures **MM BIO 1** and **MM BIO 2**, impacts to biological resources would be reduced to less than significant levels

*Potential to Eliminate Important Examples of the Major Periods of California History or Prehistory*

As discussed in Section 5. Cultural Resources and Section 18. Tribal Cultural Resources, there are no historic resources located on the Project site. As further discussed in those sections, with implementation of mitigation measures **MM CR 1**, **MM CR 2**, **MM TCR 1** and **MM TCR 2**, potential impacts resulting from an inadvertent discovery of an archaeological or tribal cultural resource will be reduced to less than significant.

**21b. Response:** *(Source: Above Environmental Checklist)*

**Less Than Significant Impact.** Based on the analysis identified in this Initial Study, the Project will not have cumulatively considerable impacts. The proposed is the construction and operation of a new reservoir and booster pump to serve planned development within JCSD's 1200 Pressure Zone. All Project impacts are less than significant or can be reduced to less than significant levels with implementation of mitigation measures. Because the Project's incremental impacts are not cumulatively considerable, no mitigation beyond what has been previously identified is required.

**21c. Response:** *(Source: Above Environmental Checklist)*

**Less Than Significant Impacts with Mitigation Incorporated.** Impacts related to aesthetics, air quality, cultural resources as it relates to human remains, geology and soils, GHGs, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, population and housing, public services, recreation, traffic, and utilities and service systems that could potentially affect human beings were analyzed in this Initial Study. All direct, indirect, and cumulative impacts were less than significant or considered to be less than significant with mitigation incorporated.

## REFERENCES

The following documents were referred to as information sources during preparation of this document. They are available for public review at the locations identified.


2016 Study — Albert A. Webb Associates, *1200 Pressure Zone Evaluation Technical Memo,* July 6, 2016. (Available at Jurupa Community Services District, Engineering Department, 11201 Harrel Street, Jurupa Valley, CA, 91752.)

AQMP — South Coast Air Quality Management District, *Final 2016 Air Quality Management Plan*, March 2017. (Available at http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp, accessed June 14, 2019.)

ALUC — Riverside County Airport Land Use Commission, *Riverside County Airport Land Use Compatibility Plan*, October 14, 2014. (Available at http://www.rcaluc.org/Plans/New-Compatibility-Plan, accessed July 3, 2019.)

BRTR — Cadre Environmental, *Biological Resources Technical Report, Jurupa Community Services District's Benedict Reservoir Project, City of Jurupa Valley, Riverside County, CA,* July 2019. (Available as Appendix B.1 to this Initial Study.)

CAGN Focused Surveys — Cadre Environmental, *Coastal California Gnatcatcher United States Fish and Wildlife Service Focused Surveys for the 1.07-Acre Jurupa Community Services District's benedict Reservoir Project, City of Jurupa Valley, California*, July 16, 2019. (Available as Appendix B.2 to this Initial Study.)

CalFire — California Department of Forest and Fire Protection, *California Fire Hazard Severity Zone Map,* November 2007. (Available at http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_maps, accessed May 15, 2019.)

CalRecylce — California Department of Resources Recycling and Recovery (Cal Recycle), *Solid Waste Information System (SWIS) Facility /Site Research,* 2019. (Available on https://www2.calrecycle.ca.gov/SWFacilities/Directory/, accessed July 23, 2019.)

Caltrans — California Department of Transportation, *California Scenic Highway Mapping System,* 2011. (Available at http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm, accessed January 2, 2019.)

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## DOCUMENT PREPARATION STAFF

Albert A. Webb Associates, Planning and Environmental Services Department

Cheryl DeGano, Principal Environmental Analyst
Eliza Laws, Senior Environmental Analyst
Monica Tobias, Assistant Environmental Analyst
Nanette Pratini, GIS Specialist

# Appendix A

ALBERT A. WEBB ASSOCIATES

# Technical Memorandum

To: Eddie Rhee, PE., Engineering Manager

From: Eliza Laws, Senior Environmental Analyst
Monica Tobias, Assistant Environmental Analyst

Date: July 19, 2019

Re: Air Quality/Greenhouse Gas Analysis for the Benedict Reservoir and Armstrong Booster Station C195057 Project for Jurupa Community Services District

The following air quality assessment was prepared to evaluate whether the expected criteria air pollutant emissions generated as a result of construction and operation of the proposed Project would cause exceedances of the South Coast Air Quality Management District's (SCAQMD) thresholds for air quality in the Project area. The greenhouse gas (GHG) assessment was prepared to evaluate whether the expected criteria GHG emissions generated as a result of construction and operation of the proposed Project would exceed the SCAQMD draft screening significance thresholds. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the *CEQA Air Quality Handbook* prepared by the SCAQMD for quantification of emissions and evaluation of potential impacts to air resources. As recommended by SCAQMD staff, the **Cal**ifornia **E**missions **E**stimator **Mod**el® version 2016.3.2 (CalEEMod) was used to quantify Project-related emissions.

In response to increased potable water demands and environmental needs, the Jurupa Community Services District (JCSD) proposed to demolish one of the two existing water reservoirs, 0.21 million gallons (MG), and replace it with a 1.1 MG reservoir at the Benedict Reservoir located near Sandra Drive in Jurupa Valley. The Project will export approximately 100 cubic yards (cu yd) of material, and import approximately 100 cu yd. The remaining water reservoir will be recoated.

The Project will also include the construction of a 500 gallons per minute (GPM) 30 horsepower (HP) pump at the Armstrong Booster Station, located on the corner of Armstrong Road and Karen Lane in Jurupa Valley.

The Project will disturb approximately 0.80 acres.

## ▪ Regional Significance Thresholds

The thresholds contained in the *SCAQMD CEQA Air Quality Handbook*[1] (SCAQMD 1993) are considered regional thresholds and are shown in **Table 1 – SCAQMD CEQA Daily Regional Significance Thresholds**, below. These regional thresholds were developed based on the SCAQMD's treatment of a major stationary source.

**Table 1 – SCAQMD CEQA Daily Regional Significance Thresholds**

| Emission Threshold | Units | VOC | $NO_X$ | CO | $SO_X$ | PM-10 | PM-2.5 |
|---|---|---|---|---|---|---|---|
| Construction | lbs/day | 75 | 100 | 550 | 150 | 150 | 55 |
| Operation | lbs/day | 55 | 55 | 550 | 150 | 150 | 55 |

Air quality impacts can be described in a short- and long-term perspective. Short-term impacts occur during site grading and Project construction and consist of fugitive dust and other particulate matter, as well as exhaust emissions generated by construction-related vehicles. Long-term air quality impacts occur once the Project is in operation. The additional facilitates constructed are not anticipated to increase the frequency of ongoing maintenance activities. Operational emissions would primarily be from the additional electric pump and infrequent visits by vehicles driven by maintenance personnel and are considered negligible; therefore, only short-term impacts were quantified.

The Project will be required to comply with existing SCAQMD rules for the reduction of fugitive dust emissions. SCAQMD Rule 403 establishes these procedures. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as the application of water or chemical stabilizers to disturbed soils, reducing haul road dust by application of water, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 mph, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, projects that disturb 50 or more acres or more of soil, or move 5,000 cubic yards of materials per day are required to submit a Fugitive Dust Control Plan or a Large Operation Notification Form to SCAQMD. Based on the size of this Project's disturbance area (0.8 acres), a Fugitive Dust Control Plan or a Large Operation Notification Form would not be required.

### Short-Term Analysis

Short-term emissions from Project construction were evaluated using the CalEEMod version 2016.3.2. program. The estimated construction period for the proposed Project is approximately twelve months, beginning no sooner than January 2020. The default parameters within CalEEMod were used, except as identified below, and these default values generally reflect a worst-case scenario, which means that Project emissions are expected to be equal to or less than the estimated emissions. In addition to the default values used, assumptions for each component of the Project relevant to model inputs for short-term construction emission estimates used are:

- Construction is anticipated to begin January 2020 with demolition and end with pipework (trenching):

| Construction Activity | Start Date | End Date | Total Working Days |
|---|---|---|---|
| Demolition | January 20, 2020 | January 31, 2020 | 10 days |
| Grading | February 01, 2020 | March 13, 2020 | 30 days |
| Tank Construction | March 14, 2020 | August 28, 2020 | 120 days |
| Booster Station (Grading) | August 1, 2020 | October 9, 2020 | 50 days |
| Tank Coating | August 29, 2020 | October 30, 2020 | 45 days |

[1] South Coast Air Quality Management District, *CEQA Air Quality Handbook*, November 1993. (Available at SCAQMD.)

| | | | |
|---|---|---|---|
| Paving | November 1, 2020 | December 11, 2020 | 30 days |
| Pipe work (Trenching) | December 12, 2020 | December 19, 2020 | 5 days |

- The equipment to be used for each activity is shown below and is based on CalEEMod defaults. Each piece of equipment is assumed to operate 8 hours per day:

| Construction Activity | Off-Road Equipment | Unit Amount | Hours/Day |
|---|---|---|---|
| Demolition | Concrete/Industrial Saw | 1 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| Grading | Crushing/Proc equipment | 1 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| Tank Construction | Crane[1] | 1 | 8 |
| | Forklift | 1 | 8 |
| | Tractors/Loaders/Backhoes | 1 | 8 |
| | Welder | 1 | 8 |
| Booster Station Construction (Grading) | Concrete/Industrial Saw[1] | 1 | 8 |
| | Crane | 1 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| Tank Coating | Air Compressor | 2 | 8 |
| | Pumps (Dehumidifier)[2] | 1 | 24 |
| Pipe work (Trenching) | Tractors/Loaders/Backhoe | 1 | 8 |
| Paving | Pavers | 1 | 8 |
| | Rollers | 1 | 8 |
| | Tractors/Loaders/Backhoes | 1 | 8 |

[1] The Crane and Concrete/industrial Saw are only required for a single day during Tank Construction and Booster Station construction, respectively. For modeling purposes, this equipment was assumed to operate the entire duration of each activity, which provides a worst case scenario.
[2] The CalEEMod equipment list does not include a dehumidifier. The Pump was used as a proxy for the dehumidifier because it most closely resembles the dehumidifier. While the precise specifications for the dehumidifier are currently unknown, it is anticipated to be an industrial sized piece of equipment that is diesel fueled. The dehumidifier will only be required for a single day, but will run for 24 hours. For modeling purposes, this equipment was assumed to operate the entire duration of this activity, which provides a worst case scenario.

- To evaluate Project compliance with SCAQMD Rule 403 for fugitive dust control, the Project utilized the mitigation option of watering the Project site three times daily which achieves a control efficiency of 61 percent for PM-10 and PM-2.5 emissions. Two (2) one-way vendor truck trips per day were added to the grading and tank construction activities to account for water truck trips.

- Four (4) vendor truck trips per day were added for material delivery and removal during tank construction, booster station, tank coating, and pipe work activities.

- Ten (10) total heavy duty truck trips (20 one-way trips) are anticipated during two days of demolition to remove the scrap steel from the disassembled tank. For modeling purposes, 10 one-way heavy duty truck trips were added each day during demolition, which provides a more conservative analysis. The default hauling trip length of 20 miles was assumed because the destination is unknown.

- Approximately 500 cu yd of soil will be imported during grading operations. Approximately 100 cu yd is assumed to be exported because of potentially unsuitable materials such as large rocks that don't break down. Truck capacity is assumed to be 16 cubic yards, resulting in approximately 32 truckloads of import over the 30 grading day period, or approximately 1

truckload per day. The import site is currently unknown. Therefore, the CalEEMod default was utilized which assumes a hauling trip length of 20 miles per trip.

- Architectural coating includes both the recoating of the exterior of the existing 1.0 MG tank that will remain and the interior and exterior of the new 1.1 MG tank being constructed. The surface area to be coated for both the interior and exterior tank surfaces was calculated and entered into CalEEMod to estimate the emissions from these activities.

The results of this analysis are summarized below. The results are provided for each phase of the Project.

**Table 2 – Unmitigated Estimated Maximum Daily Construction Emissions**

| Activity | Peak Daily Emissions (lb/day) | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $NO_X$ | CO | $SO_2$ | PM-10 | PM-2.5 |
| **SCAQMD Daily Construction Thresholds** | **75** | **100** | **550** | **150** | **150** | **55** |
| Demolition | 2.02 | 21.26 | 13.07 | 0.03 | 1.31 | 1.04 |
| Grading | 2.12 | 20.17 | 13.56 | 0.03 | **3.58** | **2.34** |
| Tank Construction | 1.26 | 11.65 | 8.17 | 0.02 | 0.79 | 0.58 |
| Booster Station Construction | **1.35** | **13.34** | **10.84** | **0.02** | 0.83 | 0.69 |
| Tank Coating | **8.45** | **13.25** | **13.93** | **0.03** | 0.83 | 0.79 |
| Pipe Work (Trenching) | 0.24 | 2.53 | 2.48 | 0.00 | 0.19 | 0.14 |
| Paving | 0.98 | 7.02 | 7.39 | 0.01 | 0.49 | 0.39 |
| **Maximum[1]** | **9.80** | **26.59** | **24.77** | **0.05** | **3.58** | **2.34** |
| **Exceeds Threshold?** | **No** | **No** | **No** | **No** | **No** | **No** |

Note: [1] Maximum emissions are the greater of either demolition, grading, pipe work, or paving alone, or the sum of tank construction and booster station construction or booster station construction and tank coating since these activities overlap.

As shown in **Table 2**, above, the emissions from construction of the Project are below the SCAQMD daily construction thresholds for all the criteria pollutants.

### Long-Term Analysis

Long-term air quality impacts occur once the Project is in operation.

Operational emissions related to the reservoir and booster station would be primarily from the infrequent visits by vehicles driven by maintenance personnel and are considered negligible. In addition, both locations are currently operating and the additional facilitates constructed are not anticipated to increase the frequency of ongoing maintenance activities.

## ▪ Localized Significance Threshold Analysis

### Background

As part of the SCAQMD's environmental justice program, attention has been focused on localized effects of air quality. Staff at SCAQMD has developed localized significance threshold (LST) methodology[2] that can be used by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts (both short- and long-term). LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the state

[2] South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, Revised July 2008. (Available at http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds, accessed July 2019.)

ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area (SRA). The Project is located in SRA 23.

## Short-Term Analysis

According to the LST methodology, only on-site emissions need to be analyzed. Emissions associated with vendor and worker trips are mobile source emissions that occur off site. The emissions analyzed under the LST methodology are $NO_2$, CO, PM-10, and PM-2.5. SCAQMD has provided LST lookup tables[3] to allow users to readily determine if the daily emissions for proposed construction or operational activities could result in significant localized air quality impacts for projects five acres or smaller. The LST tables can be used as a screening tool to determine if dispersion modeling would be necessary. If project-related emissions are below the LST table emissions, no further analysis is necessary. The Project site disturbs approximately 0.8 acres. Therefore, the LST for one-acre site was utilized.

The LST thresholds are estimated using the maximum daily disturbed area (in acres) and the distance of the Project to the nearest sensitive receptors (in meters). The closest sensitive receptors to the Project construction site are existing residential uses along Sandra Drive approximately 372 feet (113 meters) southeast of the reservoir site and residential uses along Armstrong Road and Karen Lane adjacent to the booster station site. According to LST methodology, projects with boundaries closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters. Therefore, a receptor distance of 25 meters (85 feet) was used to ensure a conservative analysis.

**Table 3 – Unmitigated LST Results for Daily Construction Emissions**

| Pollutant | Peak Daily Emissions (lb/day) | | | |
|---|---|---|---|---|
| | $NO_X$ | CO | PM-10 | PM-2.5 |
| **LST Threshold for 1-acre at 25 meters** | **118** | **602** | **4** | **3** |
| Demolition | 18.84 | 12.38 | 1.02 | 0.95 |
| Grading | 19.34 | 13.04 | **3.41** | **2.29** |
| Tank Construction | 10.37 | 7.34 | 0.54 | 0.50 |
| Booster Station Construction | **12.90** | **10.36** | 0.69 | 0.65 |
| Tank Coating | **12.83** | **13.73** | 0.77 | 0.77 |
| Pipe Work (Trenching) | 2.11 | 2.28 | 0.13 | 0.12 |
| Paving | 7.00 | 7.07 | 0.40 | 0.37 |
| **Maximum**[1] | **25.73** | **24.09** | **3.41** | **2.29** |
| **Exceeds Threshold?** | **No** | **No** | **No** | **No** |

Note: [1] Maximum emissions are the greater of either demolition, grading, pipe work, or paving alone or the sum of tank construction and booster station construction or booster station construction and tank coating since these activities overlap.

Therefore, as shown in **Table 3,** emissions from construction of the Project will be below the LST established by SCAQMD for the Project.

## Long-Term Analysis

The Project involves the construction of a reservoir and additional pump in the booster station. The long-term emissions from the reservoir, as discussed previously, are primarily in the form of mobile source emissions, with no stationary sources of emissions present. The new pump at the booster station will be similar to the existing pumps and is electric. The booster station has an existing diesel-powered emergency generator. No changes are required for this stand-by generator. According to the LST methodology, LSTs only apply to the operational phase if a project includes stationary sources or on-site

[3] http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds

mobile equipment generating on-site emissions. The proposed Project does not include such uses. Therefore, no long-term LST analysis is needed.

## ▪ Greenhouse Gas Analysis

Greenhouse gases (GHG) are not presented in lbs/day like criteria pollutants; they are typically evaluated on an annual basis using the metric system. Several agencies, at various levels, have proposed draft GHG significance thresholds for use in CEQA documents. SCAQMD has been working on GHG thresholds for development projects. In December 2008, the SCAQMD adopted a threshold of 10,000 metric tonnes per year of carbon dioxide equivalents ($MTCO_2E$/yr) for stationary source projects where SCAQMD is the lead agency. The most recent draft proposal was in September 2010[4] and included screening significance thresholds for residential, commercial, and mixed-use projects at 3,500, 1,400, and 3,000 $MTCO_2E$/yr, respectively. Alternatively, a lead agency has the option to use 3,000 $MTCO_2E$/yr as a threshold for all non-industrial projects. Although both options are recommended by SCAQMD, a lead agency is advised to use only one option and to use it consistently. The SCAQMD significance thresholds also evaluate construction emissions by amortizing them over an expected project life of 30 years. If emissions are above the screening level threshold, additional analysis may be required. The analysis herein uses the threshold of 3,000 $MTCO_2E$/yr.

### Short-Term Analysis

#### Construction-Related Emissions

The CalEEMod model calculates GHG emissions from fuel usage by construction equipment and construction-related activities, like construction worker trips, for the Project. The CalEEMod estimate does not analyze emissions from construction-related electricity or natural gas. Construction-related electricity and natural gas emissions vary based on the amount of electric power used during construction and other unknown factors which make them too speculative to quantify. The CalEEMod output results for construction-related GHG emissions provide for $CO_2$, methane ($CH_4$), nitrous oxide ($N_2O$), and $CO_2E$[5] as shown on **Table 7**.

**Table 7 – Project Construction Equipment GHG Emissions**

| Year | Metric Tons per year (MT/yr) | | | |
|---|---|---|---|---|
| | Total $CO_2$ | Total $CH_4$ | Total $N_2O$ | Total $CO_2E$ |
| 2020 | 240.31 | 0.05 | 0.00 | 241.45 |
| **Total** | | | | **241.45** |
| | | | **Amortized[1]** | **8.05** |

Note: [1]Construction emissions were amortized over a 30 year period, as recommended by SCAQMD.

Results indicate that an estimated 241.5 $MTCO_2E$ will occur from Project construction equipment over the course of the estimated approximately 12 month construction period. The draft SCAQMD GHG threshold guidance document released in October 2008[6] recommends that construction emissions be amortized for a project lifetime of 30 years to ensure that GHG reduction measures address construction GHG emissions as part of the operational reduction strategies.

The proposed Project does not fit into the categories provided (industrial, commercial, and residential) in the draft thresholds from SCAQMD. The Project's emissions were compared to the 3,000 MTCO2E/yr threshold for non-industrial projects. Since the draft SCAQMD GHG threshold guidance document released in October 2008 (SCAQMD 2008b, p. 3-8) recommends that construction emissions be

[4] http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf?sfvrsn=2

[5] $CO_2E$ is the sum of $CO_2$ emissions estimated plus the sum of $CH_4$ and $N_2O$ emissions estimated multiplied by their respective global warming potential (GWP).

[6] http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-6/ghg-meeting-6-guidance-document-discussion.pdf?sfvrsn=2

amortized for a project lifetime of 30 years to, the total GHG emissions from Project construction were amortized and are below the SCAQMD recommended screening level of 3,000 MTCO2E/yr. Due to the lack of adopted emissions thresholds, the estimated amount of emissions from Project construction and negligible operational emissions from infrequent maintenance vehicles related to the reservoir and booster station improvements, the proposed Project will not generate GHG emissions that exceed the screening threshold.

## ▪ Recommended Mitigation Measures

All construction emissions were below thresholds therefore no mitigation measures are required.

## ▪ Conclusion

The conclusion of this analysis indicates that construction of the proposed Project will not exceed criteria pollutant thresholds established by SCAQMD on a regional or localized level. In addition, the Project's GHG emissions will not exceed the SCAQMD interim threshold of 3,000 $MTCO_2E$/yr.

Should you have any questions, please contact me at (951) 686-1070.

# CALEEMOD OUTPUT FILES

# Benedict Reservoir and Armstrong Booster Station
**Riverside-South Coast County, Summer**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.50 | Acre | 0.50 | 21,780.00 | 0 |
| Other Non-Asphalt Surfaces | 0.30 | Acre | 0.30 | 13,068.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.4 | **Precipitation Freq (Days)** | 28 |
| **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 - Site Plan
Construction Phase - Per Engineer
Off-road Equipment - 8 hours/day
Off-road Equipment - Per Engineer; 8 hours/day
Off-road Equipment - 8 hours/day
Off-road Equipment - 8 hour/day
Off-road Equipment - 8 hours/day
Off-road Equipment - Per Engineer
Off-road Equipment - Per Engineer; 8 hours per day
Off-road Equipment - Per Engineer
Trips and VMT - Added 4 vendor trips for material delivery to tank construction, booster station, tank coating, and pipe work; 2 vendor trips for water truck to grading; 2 addtional vendor trips to tank construcion for water truck; 10 vendor trips to demo

Demolition -
Grading - Per Engineer
Construction Off-road Equipment Mitigation - Per Rule 403
Architectural Coating - Site Plan

Benedict Reservoir and Armstrong Booster Station - Riverside-South Coast County, Summer

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblArchitecturalCoating | ConstArea_Nonresidential_Exterior | 0.00 | 26,006.00 |
| tblArchitecturalCoating | ConstArea_Nonresidential_Interior | 0.00 | 38,177.00 |
| tblConstructionPhase | NumDays | 5.00 | 45.00 |
| tblConstructionPhase | NumDays | 100.00 | 120.00 |
| tblConstructionPhase | NumDays | 2.00 | 30.00 |
| tblConstructionPhase | NumDays | 2.00 | 50.00 |
| tblGrading | MaterialExported | 0.00 | 100.00 |
| tblGrading | MaterialImported | 0.00 | 500.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 4.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 1.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 1.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblTripsAndVMT | VendorTripLength | 6.90 | 20.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 10.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 6.00 | 12.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorVehicleClass | HDT_Mix | HHDT |

# 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 | | | | | |
| 2020 | 9.7977 | 26.5949 | 24.7656 | 0.0455 | 6.1929 | 1.4617 | 7.2588 | 3.3559 | 1.4224 | 4.3559 | 0.0000 | 4,360.8791 | 4,360.8791 | 0.8095 | 0.0000 | 4,375.2264 |
| **Maximum** | **9.7977** | **26.5949** | **24.7656** | **0.0455** | **6.1929** | **1.4617** | **7.2588** | **3.3559** | **1.4224** | **4.3559** | **0.0000** | **4,360.8791** | **4,360.8791** | **0.8095** | **0.0000** | **4,375.2264** |

### 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 | | | | | |
| 2020 | 9.7977 | 26.5949 | 24.7656 | 0.0455 | 2.5179 | 1.4617 | 3.5838 | 1.3365 | 1.4224 | 2.3364 | 0.0000 | 4,360.8791 | 4,360.8791 | 0.8095 | 0.0000 | 4,375.2264 |
| **Maximum** | **9.7977** | **26.5949** | **24.7656** | **0.0455** | **2.5179** | **1.4617** | **3.5838** | **1.3365** | **1.4224** | **2.3364** | **0.0000** | **4,360.8791** | **4,360.8791** | **0.8095** | **0.0000** | **4,375.2264** |

| | **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** | **59.34** | **0.00** | **50.63** | **60.18** | **0.00** | **46.36** | **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 | 0.0150 | 0.0000 | 8.0000e-005 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.8000e-004 | 1.8000e-004 | 0.0000 | | 1.9000e-004 |
| 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** | **0.0150** | **0.0000** | **8.0000e-005** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **1.8000e-004** | **1.8000e-004** | **0.0000** | **0.0000** | **1.9000e-004** |

### Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 0.0150 | 0.0000 | 8.0000e-005 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.8000e-004 | 1.8000e-004 | 0.0000 | | 1.9000e-004 |
| 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** | **0.0150** | **0.0000** | **8.0000e-005** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **1.8000e-004** | **1.8000e-004** | **0.0000** | **0.0000** | **1.9000e-004** |

| | **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 | 1/20/2020 | 1/31/2020 | 5 | 10 | |
| 2 | Grading | Grading | 2/1/2020 | 3/13/2020 | 5 | 30 | |
| 3 | Tank Construction | Building Construction | 3/14/2020 | 8/28/2020 | 5 | 120 | |
| 4 | Booster Station | Grading | 8/1/2020 | 10/9/2020 | 5 | 50 | |
| 5 | Tank Coating | Architectural Coating | 8/29/2020 | 10/30/2020 | 5 | 45 | |
| 6 | Pipe Work | Trenching | 11/1/2020 | 12/11/2020 | 5 | 30 | |
| 7 | Paving | Paving | 12/12/2020 | 12/19/2020 | 5 | 5 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0.8**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 38,177; Non-Residential Outdoor: 26,006; Striped Parking Area: 2,091**

## 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 | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Demolition | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Grading | Concrete/Industrial Saws | 0 | 8.00 | 81 | 0.73 |
| Grading | Crushing/Proc. Equipment | 1 | 8.00 | 85 | 0.78 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Tank Construction | Cranes | 1 | 8.00 | 231 | 0.29 |
| Tank Construction | Forklifts | 1 | 8.00 | 89 | 0.20 |
| Tank Construction | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Tank Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Booster Station | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Booster Station | Cranes | 1 | 8.00 | 231 | 0.29 |
| Booster Station | Rubber Tired Dozers | 0 | 1.00 | 247 | 0.40 |
| Booster Station | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Tank Coating | Air Compressors | 1 | 8.00 | 78 | 0.48 |
| Tank Coating | Pumps | 1 | 24.00 | 84 | 0.74 |
| Pipe Work | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Paving | Cement and Mortar Mixers | 0 | 6.00 | 9 | 0.56 |
| Paving | Pavers | 1 | 8.00 | 130 | 0.42 |
| Paving | Rollers | 1 | 8.00 | 80 | 0.38 |
| Paving | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |

**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 | 4 | 10.00 | 10.00 | 0.00 | 14.70 | 20.00 | 20.00 | LD_Mix | HHDT | HHDT |
| Grading | 4 | 10.00 | 2.00 | 75.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Tank Construction | 4 | 15.00 | 12.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Booster Station | 4 | 10.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Tank Coating | 2 | 3.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Pipe Work | 1 | 3.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 8.00 | 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 - 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 | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.9167 | 18.8412 | 12.3776 | 0.0210 | | 1.0194 | 1.0194 | | 0.9537 | 0.9537 | | 2,021.5442 | 2,021.5442 | 0.4997 | | 2,034.0360 |
| **Total** | **1.9167** | **18.8412** | **12.3776** | **0.0210** | **0.0000** | **1.0194** | **1.0194** | **0.0000** | **0.9537** | **0.9537** | | **2,021.5442** | **2,021.5442** | **0.4997** | | **2,034.0360** |

### 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 | 0.0514 | 2.3679 | 0.2922 | 7.6100e-003 | 0.1749 | 7.5400e-003 | 0.1825 | 0.0480 | 7.2200e-003 | 0.0552 | | 807.7673 | 807.7673 | 0.0481 | | 808.9707 |
| Worker | 0.0509 | 0.0301 | 0.4032 | 1.1100e-003 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 110.1595 | 110.1595 | 2.8200e-003 | | 110.2301 |
| **Total** | **0.1023** | **2.3980** | **0.6954** | **8.7200e-003** | **0.2867** | **8.2200e-003** | **0.2949** | **0.0776** | **7.8400e-003** | **0.0854** | | **917.9267** | **917.9267** | **0.0510** | | **919.2008** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.9167 | 18.8412 | 12.3776 | 0.0210 | | 1.0194 | 1.0194 | | 0.9537 | 0.9537 | 0.0000 | 2,021.5442 | 2,021.5442 | 0.4997 | | 2,034.0360 |
| **Total** | **1.9167** | **18.8412** | **12.3776** | **0.0210** | **0.0000** | **1.0194** | **1.0194** | **0.0000** | **0.9537** | **0.9537** | **0.0000** | **2,021.5442** | **2,021.5442** | **0.4997** | | **2,034.0360** |

## 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 | 0.0514 | 2.3679 | 0.2922 | 7.6100e-003 | 0.1749 | 7.5400e-003 | 0.1825 | 0.0480 | 7.2200e-003 | 0.0552 | | 807.7673 | 807.7673 | 0.0481 | | 808.9707 |
| Worker | 0.0509 | 0.0301 | 0.4032 | 1.1100e-003 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 110.1595 | 110.1595 | 2.8200e-003 | | 110.2301 |
| **Total** | **0.1023** | **2.3980** | **0.6954** | **8.7200e-003** | **0.2867** | **8.2200e-003** | **0.2949** | **0.0776** | **7.8400e-003** | **0.0854** | | **917.9267** | **917.9267** | **0.0510** | | **919.2008** |

## 3.3 Grading - 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 | | | | | |
| Fugitive Dust | | | | | 6.0246 | 0.0000 | 6.0246 | 3.3106 | 0.0000 | 3.3106 | | | 0.0000 | | | 0.0000 |
| Off-Road | 2.0516 | 19.3417 | 13.0433 | 0.0218 | | 1.0621 | 1.0621 | | 0.9964 | 0.9964 | | 2,093.4096 | 2,093.4096 | 0.5112 | | 2,106.1907 |
| **Total** | **2.0516** | **19.3417** | **13.0433** | **0.0218** | **6.0246** | **1.0621** | **7.0867** | **3.3106** | **0.9964** | **4.3070** | | **2,093.4096** | **2,093.4096** | **0.5112** | | **2,106.1907** |

### 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 | 0.0129 | 0.5920 | 0.0730 | 1.9000e-003 | 0.0437 | 1.8900e-003 | 0.0456 | 0.0120 | 1.8000e-003 | 0.0138 | | 201.9418 | 201.9418 | 0.0120 | | 202.2427 |
| Vendor | 5.5700e-003 | 0.2058 | 0.0377 | 5.2000e-004 | 0.0128 | 1.1700e-003 | 0.0140 | 3.6900e-003 | 1.1200e-003 | 4.8100e-003 | | 55.0782 | 55.0782 | 4.1300e-003 | | 55.1815 |
| Worker | 0.0509 | 0.0301 | 0.4032 | 1.1100e-003 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 110.1595 | 110.1595 | 2.8200e-003 | | 110.2301 |
| **Total** | **0.0693** | **0.8278** | **0.5139** | **3.5300e-003** | **0.1683** | **3.7400e-003** | **0.1721** | **0.0453** | **3.5400e-003** | **0.0489** | | **367.1795** | **367.1795** | **0.0190** | | **367.6542** |

## 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 | | | | | 2.3496 | 0.0000 | 2.3496 | 1.2911 | 0.0000 | 1.2911 | | | 0.0000 | | | 0.0000 |
| Off-Road | 2.0516 | 19.3417 | 13.0433 | 0.0218 | | 1.0621 | 1.0621 | | 0.9964 | 0.9964 | 0.0000 | 2,093.4096 | 2,093.4096 | 0.5112 | | 2,106.1907 |
| **Total** | **2.0516** | **19.3417** | **13.0433** | **0.0218** | **2.3496** | **1.0621** | **3.4117** | **1.2911** | **0.9964** | **2.2875** | **0.0000** | **2,093.4096** | **2,093.4096** | **0.5112** | | **2,106.1907** |

## 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 | 0.0129 | 0.5920 | 0.0730 | 1.9000e-003 | 0.0437 | 1.8900e-003 | 0.0456 | 0.0120 | 1.8000e-003 | 0.0138 | | 201.9418 | 201.9418 | 0.0120 | | 202.2427 |
| Vendor | 5.5700e-003 | 0.2058 | 0.0377 | 5.2000e-004 | 0.0128 | 1.1700e-003 | 0.0140 | 3.6900e-003 | 1.1200e-003 | 4.8100e-003 | | 55.0782 | 55.0782 | 4.1300e-003 | | 55.1815 |
| Worker | 0.0509 | 0.0301 | 0.4032 | 1.1100e-003 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 110.1595 | 110.1595 | 2.8200e-003 | | 110.2301 |
| **Total** | **0.0693** | **0.8278** | **0.5139** | **3.5300e-003** | **0.1683** | **3.7400e-003** | **0.1721** | **0.0453** | **3.5400e-003** | **0.0489** | | **367.1795** | **367.1795** | **0.0190** | | **367.6542** |

## 3.4 Tank Construction - 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 | 1.1490 | 10.3655 | 7.3423 | 0.0130 | | 0.5389 | 0.5389 | | 0.5028 | 0.5028 | | 1,215.0667 | 1,215.0667 | 0.3565 | | 1,223.9802 |
| **Total** | **1.1490** | **10.3655** | **7.3423** | **0.0130** | | **0.5389** | **0.5389** | | **0.5028** | **0.5028** | | **1,215.0667** | **1,215.0667** | **0.3565** | | **1,223.9802** |

### 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 | 0.0335 | 1.2347 | 0.2259 | 3.1300e-003 | 0.0768 | 7.0200e-003 | 0.0839 | 0.0221 | 6.7200e-003 | 0.0288 | | 330.4691 | 330.4691 | 0.0248 | | 331.0888 |
| Worker | 0.0763 | 0.0451 | 0.6048 | 1.6600e-003 | 0.1677 | 1.0200e-003 | 0.1687 | 0.0445 | 9.3000e-004 | 0.0454 | | 165.2392 | 165.2392 | 4.2400e-003 | | 165.3451 |
| **Total** | **0.1098** | **1.2798** | **0.8307** | **4.7900e-003** | **0.2445** | **8.0400e-003** | **0.2526** | **0.0666** | **7.6500e-003** | **0.0742** | | **495.7083** | **495.7083** | **0.0290** | | **496.4339** |

## 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 | 1.1490 | 10.3655 | 7.3423 | 0.0130 | | 0.5389 | 0.5389 | | 0.5028 | 0.5028 | 0.0000 | 1,215.0667 | 1,215.0667 | 0.3565 | | 1,223.9802 |
| **Total** | **1.1490** | **10.3655** | **7.3423** | **0.0130** | | **0.5389** | **0.5389** | | **0.5028** | **0.5028** | **0.0000** | **1,215.0667** | **1,215.0667** | **0.3565** | | **1,223.9802** |

## 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 | 0.0335 | 1.2347 | 0.2259 | 3.1300e-003 | 0.0768 | 7.0200e-003 | 0.0839 | 0.0221 | 6.7200e-003 | 0.0288 | | 330.4691 | 330.4691 | 0.0248 | | 331.0888 |
| Worker | 0.0763 | 0.0451 | 0.6048 | 1.6600e-003 | 0.1677 | 1.0200e-003 | 0.1687 | 0.0445 | 9.3000e-004 | 0.0454 | | 165.2392 | 165.2392 | 4.2400e-003 | | 165.3451 |
| **Total** | **0.1098** | **1.2798** | **0.8307** | **4.7900e-003** | **0.2445** | **8.0400e-003** | **0.2526** | **0.0666** | **7.6500e-003** | **0.0742** | | **495.7083** | **495.7083** | **0.0290** | | **496.4339** |

## 3.5 Booster Station - 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 | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.2906 | 12.9004 | 10.3613 | 0.0182 | | 0.6867 | 0.6867 | | 0.6476 | 0.6476 | | 1,752.9913 | 1,752.9913 | 0.4128 | | 1,763.3117 |
| **Total** | **1.2906** | **12.9004** | **10.3613** | **0.0182** | **0.0000** | **0.6867** | **0.6867** | **0.0000** | **0.6476** | **0.6476** | | **1,752.9913** | **1,752.9913** | **0.4128** | | **1,763.3117** |

### 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 | 0.0112 | 0.4116 | 0.0753 | 1.0400e-003 | 0.0256 | 2.3400e-003 | 0.0280 | 7.3700e-003 | 2.2400e-003 | 9.6100e-003 | | 110.1564 | 110.1564 | 8.2600e-003 | | 110.3629 |
| Worker | 0.0509 | 0.0301 | 0.4032 | 1.1100e-003 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 110.1595 | 110.1595 | 2.8200e-003 | | 110.2301 |
| **Total** | **0.0620** | **0.4417** | **0.4785** | **2.1500e-003** | **0.1374** | **3.0200e-003** | **0.1404** | **0.0370** | **2.8600e-003** | **0.0399** | | **220.3158** | **220.3158** | **0.0111** | | **220.5930** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.2906 | 12.9004 | 10.3613 | 0.0182 | | 0.6867 | 0.6867 | | 0.6476 | 0.6476 | 0.0000 | 1,752.9913 | 1,752.9913 | 0.4128 | | 1,763.3117 |
| **Total** | **1.2906** | **12.9004** | **10.3613** | **0.0182** | **0.0000** | **0.6867** | **0.6867** | **0.0000** | **0.6476** | **0.6476** | **0.0000** | **1,752.9913** | **1,752.9913** | **0.4128** | | **1,763.3117** |

## 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 | 0.0112 | 0.4116 | 0.0753 | 1.0400e-003 | 0.0256 | 2.3400e-003 | 0.0280 | 7.3700e-003 | 2.2400e-003 | 9.6100e-003 | | 110.1564 | 110.1564 | 8.2600e-003 | | 110.3629 |
| Worker | 0.0509 | 0.0301 | 0.4032 | 1.1100e-003 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 110.1595 | 110.1595 | 2.8200e-003 | | 110.2301 |
| **Total** | **0.0620** | **0.4417** | **0.4785** | **2.1500e-003** | **0.1374** | **3.0200e-003** | **0.1404** | **0.0370** | **2.8600e-003** | **0.0399** | | **220.3158** | **220.3158** | **0.0111** | | **220.5930** |

## 3.6 Tank Coating - 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 | | | | | |
| Archit. Coating | 6.8262 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5924 | 12.8322 | 13.7296 | 0.0237 | | 0.7695 | 0.7695 | | 0.7695 | 0.7695 | | 2,244.3678 | 2,244.3678 | 0.1409 | | 2,247.8897 |
| **Total** | **8.4187** | **12.8322** | **13.7296** | **0.0237** | | **0.7695** | **0.7695** | | **0.7695** | **0.7695** | | **2,244.3678** | **2,244.3678** | **0.1409** | | **2,247.8897** |

### 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 | 0.0112 | 0.4116 | 0.0753 | 1.0400e-003 | 0.0256 | 2.3400e-003 | 0.0280 | 7.3700e-003 | 2.2400e-003 | 9.6100e-003 | | 110.1564 | 110.1564 | 8.2600e-003 | | 110.3629 |
| Worker | 0.0153 | 9.0300e-003 | 0.1210 | 3.3000e-004 | 0.0335 | 2.0000e-004 | 0.0337 | 8.8900e-003 | 1.9000e-004 | 9.0800e-003 | | 33.0478 | 33.0478 | 8.5000e-004 | | 33.0690 |
| **Total** | **0.0264** | **0.4206** | **0.1963** | **1.3700e-003** | **0.0591** | **2.5400e-003** | **0.0617** | **0.0163** | **2.4300e-003** | **0.0187** | | **143.2042** | **143.2042** | **9.1100e-003** | | **143.4319** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 6.8262 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5924 | 12.8322 | 13.7296 | 0.0237 | | 0.7695 | 0.7695 | | 0.7695 | 0.7695 | 0.0000 | 2,244.3678 | 2,244.3678 | 0.1409 | | 2,247.8897 |
| **Total** | **8.4187** | **12.8322** | **13.7296** | **0.0237** | | **0.7695** | **0.7695** | | **0.7695** | **0.7695** | **0.0000** | **2,244.3678** | **2,244.3678** | **0.1409** | | **2,247.8897** |

## 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 | 0.0112 | 0.4116 | 0.0753 | 1.0400e-003 | 0.0256 | 2.3400e-003 | 0.0280 | 7.3700e-003 | 2.2400e-003 | 9.6100e-003 | | 110.1564 | 110.1564 | 8.2600e-003 | | 110.3629 |
| Worker | 0.0153 | 9.0300e-003 | 0.1210 | 3.3000e-004 | 0.0335 | 2.0000e-004 | 0.0337 | 8.8900e-003 | 1.9000e-004 | 9.0800e-003 | | 33.0478 | 33.0478 | 8.5000e-004 | | 33.0690 |
| **Total** | **0.0264** | **0.4206** | **0.1963** | **1.3700e-003** | **0.0591** | **2.5400e-003** | **0.0617** | **0.0163** | **2.4300e-003** | **0.0187** | | **143.2042** | **143.2042** | **9.1100e-003** | | **143.4319** |

## 3.7 Pipe Work - 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 | 0.2095 | 2.1052 | 2.2797 | 3.1100e-003 | | 0.1331 | 0.1331 | | 0.1225 | 0.1225 | | 300.7685 | 300.7685 | 0.0973 | | 303.2004 |
| **Total** | **0.2095** | **2.1052** | **2.2797** | **3.1100e-003** | | **0.1331** | **0.1331** | | **0.1225** | **0.1225** | | **300.7685** | **300.7685** | **0.0973** | | **303.2004** |

### 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 | 0.0112 | 0.4116 | 0.0753 | 1.0400e-003 | 0.0256 | 2.3400e-003 | 0.0280 | 7.3700e-003 | 2.2400e-003 | 9.6100e-003 | | 110.1564 | 110.1564 | 8.2600e-003 | | 110.3629 |
| Worker | 0.0153 | 9.0300e-003 | 0.1210 | 3.3000e-004 | 0.0335 | 2.0000e-004 | 0.0337 | 8.8900e-003 | 1.9000e-004 | 9.0800e-003 | | 33.0478 | 33.0478 | 8.5000e-004 | | 33.0690 |
| **Total** | **0.0264** | **0.4206** | **0.1963** | **1.3700e-003** | **0.0591** | **2.5400e-003** | **0.0617** | **0.0163** | **2.4300e-003** | **0.0187** | | **143.2042** | **143.2042** | **9.1100e-003** | | **143.4319** |

## 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 | 0.2095 | 2.1052 | 2.2797 | 3.1100e-003 | | 0.1331 | 0.1331 | | 0.1225 | 0.1225 | 0.0000 | 300.7685 | 300.7685 | 0.0973 | | 303.2004 |
| **Total** | **0.2095** | **2.1052** | **2.2797** | **3.1100e-003** | | **0.1331** | **0.1331** | | **0.1225** | **0.1225** | **0.0000** | **300.7685** | **300.7685** | **0.0973** | | **303.2004** |

## 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 | 0.0112 | 0.4116 | 0.0753 | 1.0400e-003 | 0.0256 | 2.3400e-003 | 0.0280 | 7.3700e-003 | 2.2400e-003 | 9.6100e-003 | | 110.1564 | 110.1564 | 8.2600e-003 | | 110.3629 |
| Worker | 0.0153 | 9.0300e-003 | 0.1210 | 3.3000e-004 | 0.0335 | 2.0000e-004 | 0.0337 | 8.8900e-003 | 1.9000e-004 | 9.0800e-003 | | 33.0478 | 33.0478 | 8.5000e-004 | | 33.0690 |
| **Total** | **0.0264** | **0.4206** | **0.1963** | **1.3700e-003** | **0.0591** | **2.5400e-003** | **0.0617** | **0.0163** | **2.4300e-003** | **0.0187** | | **143.2042** | **143.2042** | **9.1100e-003** | | **143.4319** |

## 3.8 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 | 0.6803 | 6.9966 | 7.0714 | 0.0104 | | 0.4024 | 0.4024 | | 0.3702 | 0.3702 | | 1,010.1070 | 1,010.1070 | 0.3267 | | 1,018.2743 |
| Paving | 0.2620 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.9423** | **6.9966** | **7.0714** | **0.0104** | | **0.4024** | **0.4024** | | **0.3702** | **0.3702** | | **1,010.1070** | **1,010.1070** | **0.3267** | | **1,018.2743** |

### 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 | 0.0407 | 0.0241 | 0.3226 | 8.8000e-004 | 0.0894 | 5.4000e-004 | 0.0900 | 0.0237 | 5.0000e-004 | 0.0242 | | 88.1276 | 88.1276 | 2.2600e-003 | | 88.1840 |
| **Total** | **0.0407** | **0.0241** | **0.3226** | **8.8000e-004** | **0.0894** | **5.4000e-004** | **0.0900** | **0.0237** | **5.0000e-004** | **0.0242** | | **88.1276** | **88.1276** | **2.2600e-003** | | **88.1840** |

## 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 | 0.6803 | 6.9966 | 7.0714 | 0.0104 | | 0.4024 | 0.4024 | | 0.3702 | 0.3702 | 0.0000 | 1,010.1070 | 1,010.1070 | 0.3267 | | 1,018.2743 |
| Paving | 0.2620 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.9423** | **6.9966** | **7.0714** | **0.0104** | | **0.4024** | **0.4024** | | **0.3702** | **0.3702** | **0.0000** | **1,010.1070** | **1,010.1070** | **0.3267** | | **1,018.2743** |

## 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 | 0.0407 | 0.0241 | 0.3226 | 8.8000e-004 | 0.0894 | 5.4000e-004 | 0.0900 | 0.0237 | 5.0000e-004 | 0.0242 | | 88.1276 | 88.1276 | 2.2600e-003 | | 88.1840 |
| **Total** | **0.0407** | **0.0241** | **0.3226** | **8.8000e-004** | **0.0894** | **5.4000e-004** | **0.0900** | **0.0237** | **5.0000e-004** | **0.0242** | | **88.1276** | **88.1276** | **2.2600e-003** | | **88.1840** |

# Benedict Reservoir and Armstrong Booster Station
**Riverside-South Coast County, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.50 | Acre | 0.50 | 21,780.00 | 0 |
| Other Non-Asphalt Surfaces | 0.30 | Acre | 0.30 | 13,068.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.4 | **Precipitation Freq (Days)** | 28 |
| **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 - Site Plan
Construction Phase - Per Engineer
Off-road Equipment - 8 hours/day
Off-road Equipment - Per Engineer; 8 hours/day
Off-road Equipment - 8 hours/day
Off-road Equipment - 8 hour/day
Off-road Equipment - 8 hours/day
Off-road Equipment - Per Engineer
Off-road Equipment - Per Engineer; 8 hours per day
Off-road Equipment - Per Engineer
Trips and VMT - Added 4 vendor trips for material delivery to tank construction, booster station, tank coating, and pipe work; 2 vendor trips for water truck to grading; 2 addtional vendor trips to tank construcion for water truck; 10 vendor trips to demo

Demolition -
Grading - Per Engineer
Construction Off-road Equipment Mitigation - Per Rule 403
Architectural Coating - Site Plan

Benedict Reservoir and Armstrong Booster Station - Riverside-South Coast County, Winter

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblArchitecturalCoating | ConstArea_Nonresidential_Exterior | 0.00 | 26,006.00 |
| tblArchitecturalCoating | ConstArea_Nonresidential_Interior | 0.00 | 38,177.00 |
| tblConstructionPhase | NumDays | 5.00 | 45.00 |
| tblConstructionPhase | NumDays | 100.00 | 120.00 |
| tblConstructionPhase | NumDays | 2.00 | 30.00 |
| tblConstructionPhase | NumDays | 2.00 | 50.00 |
| tblGrading | MaterialExported | 0.00 | 100.00 |
| tblGrading | MaterialImported | 0.00 | 500.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 4.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 1.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 1.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblTripsAndVMT | VendorTripLength | 6.90 | 20.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 10.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 6.00 | 12.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorVehicleClass | HDT_Mix | HHDT |

# 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 | | | | | |
| 2020 | 9.7976 | 26.5920 | 24.6912 | 0.0453 | 6.1929 | 1.4618 | 7.2588 | 3.3559 | 1.4224 | 4.3559 | 0.0000 | 4,337.8639 | 4,337.8639 | 0.8123 | 0.0000 | 4,352.2458 |
| **Maximum** | **9.7976** | **26.5920** | **24.6912** | **0.0453** | **6.1929** | **1.4618** | **7.2588** | **3.3559** | **1.4224** | **4.3559** | **0.0000** | **4,337.8639** | **4,337.8639** | **0.8123** | **0.0000** | **4,352.2458** |

### 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 | | | | | |
| 2020 | 9.7976 | 26.5920 | 24.6912 | 0.0453 | 2.5179 | 1.4618 | 3.5838 | 1.3365 | 1.4224 | 2.3365 | 0.0000 | 4,337.8639 | 4,337.8639 | 0.8123 | 0.0000 | 4,352.2458 |
| **Maximum** | **9.7976** | **26.5920** | **24.6912** | **0.0453** | **2.5179** | **1.4618** | **3.5838** | **1.3365** | **1.4224** | **2.3365** | **0.0000** | **4,337.8639** | **4,337.8639** | **0.8123** | **0.0000** | **4,352.2458** |

| | 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** | **59.34** | **0.00** | **50.63** | **60.18** | **0.00** | **46.36** | **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 | 0.0150 | 0.0000 | 8.0000e-005 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.8000e-004 | 1.8000e-004 | 0.0000 | | 1.9000e-004 |
| 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** | **0.0150** | **0.0000** | **8.0000e-005** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **1.8000e-004** | **1.8000e-004** | **0.0000** | **0.0000** | **1.9000e-004** |

### Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 0.0150 | 0.0000 | 8.0000e-005 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.8000e-004 | 1.8000e-004 | 0.0000 | | 1.9000e-004 |
| 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** | **0.0150** | **0.0000** | **8.0000e-005** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **1.8000e-004** | **1.8000e-004** | **0.0000** | **0.0000** | **1.9000e-004** |

| | **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 | 1/20/2020 | 1/31/2020 | 5 | 10 | |
| 2 | Grading | Grading | 2/1/2020 | 3/13/2020 | 5 | 30 | |
| 3 | Tank Construction | Building Construction | 3/14/2020 | 8/28/2020 | 5 | 120 | |
| 4 | Booster Station | Grading | 8/1/2020 | 10/9/2020 | 5 | 50 | |
| 5 | Tank Coating | Architectural Coating | 8/29/2020 | 10/30/2020 | 5 | 45 | |
| 6 | Pipe Work | Trenching | 11/1/2020 | 12/11/2020 | 5 | 30 | |
| 7 | Paving | Paving | 12/12/2020 | 12/19/2020 | 5 | 5 | |

**Acres of Grading (Site Preparation Phase): 0**
**Acres of Grading (Grading Phase): 0**
**Acres of Paving: 0.8**
**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 38,177; Non-Residential Outdoor: 26,006; Striped Parking Area: 2,091**

## 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 | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Demolition | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Grading | Concrete/Industrial Saws | 0 | 8.00 | 81 | 0.73 |
| Grading | Crushing/Proc. Equipment | 1 | 8.00 | 85 | 0.78 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Tank Construction | Cranes | 1 | 8.00 | 231 | 0.29 |
| Tank Construction | Forklifts | 1 | 8.00 | 89 | 0.20 |
| Tank Construction | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Tank Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Booster Station | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Booster Station | Cranes | 1 | 8.00 | 231 | 0.29 |
| Booster Station | Rubber Tired Dozers | 0 | 1.00 | 247 | 0.40 |
| Booster Station | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Tank Coating | Air Compressors | 1 | 8.00 | 78 | 0.48 |
| Tank Coating | Pumps | 1 | 24.00 | 84 | 0.74 |
| Pipe Work | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Paving | Cement and Mortar Mixers | 0 | 6.00 | 9 | 0.56 |
| Paving | Pavers | 1 | 8.00 | 130 | 0.42 |
| Paving | Rollers | 1 | 8.00 | 80 | 0.38 |
| Paving | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |

**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 | 4 | 10.00 | 10.00 | 0.00 | 14.70 | 20.00 | 20.00 | LD_Mix | HHDT | HHDT |
| Grading | 4 | 10.00 | 2.00 | 75.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Tank Construction | 4 | 15.00 | 12.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Booster Station | 4 | 10.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Tank Coating | 2 | 3.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Pipe Work | 1 | 3.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 8.00 | 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 - 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 | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.9167 | 18.8412 | 12.3776 | 0.0210 | | 1.0194 | 1.0194 | | 0.9537 | 0.9537 | | 2,021.5442 | 2,021.5442 | 0.4997 | | 2,034.0360 |
| **Total** | **1.9167** | **18.8412** | **12.3776** | **0.0210** | **0.0000** | **1.0194** | **1.0194** | **0.0000** | **0.9537** | **0.9537** | | **2,021.5442** | **2,021.5442** | **0.4997** | | **2,034.0360** |

### 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 | 0.0541 | 2.3886 | 0.3422 | 7.4200e-003 | 0.1749 | 7.6500e-003 | 0.1826 | 0.0480 | 7.3200e-003 | 0.0553 | | 787.5578 | 787.5578 | 0.0527 | | 788.8751 |
| Worker | 0.0498 | 0.0311 | 0.3262 | 9.9000e-004 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 98.8236 | 98.8236 | 2.4500e-003 | | 98.8849 |
| **Total** | **0.1039** | **2.4197** | **0.6684** | **8.4100e-003** | **0.2867** | **8.3300e-003** | **0.2950** | **0.0776** | **7.9400e-003** | **0.0856** | | **886.3814** | **886.3814** | **0.0551** | | **887.7600** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.9167 | 18.8412 | 12.3776 | 0.0210 | | 1.0194 | 1.0194 | | 0.9537 | 0.9537 | 0.0000 | 2,021.5442 | 2,021.5442 | 0.4997 | | 2,034.0360 |
| **Total** | **1.9167** | **18.8412** | **12.3776** | **0.0210** | **0.0000** | **1.0194** | **1.0194** | **0.0000** | **0.9537** | **0.9537** | **0.0000** | **2,021.5442** | **2,021.5442** | **0.4997** | | **2,034.0360** |

## 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 | 0.0541 | 2.3886 | 0.3422 | 7.4200e-003 | 0.1749 | 7.6500e-003 | 0.1826 | 0.0480 | 7.3200e-003 | 0.0553 | | 787.5578 | 787.5578 | 0.0527 | | 788.8751 |
| Worker | 0.0498 | 0.0311 | 0.3262 | 9.9000e-004 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 98.8236 | 98.8236 | 2.4500e-003 | | 98.8849 |
| **Total** | **0.1039** | **2.4197** | **0.6684** | **8.4100e-003** | **0.2867** | **8.3300e-003** | **0.2950** | **0.0776** | **7.9400e-003** | **0.0856** | | **886.3814** | **886.3814** | **0.0551** | | **887.7600** |

## 3.3 Grading - 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 | | | | | |
| Fugitive Dust | | | | | 6.0246 | 0.0000 | 6.0246 | 3.3106 | 0.0000 | 3.3106 | | | 0.0000 | | | 0.0000 |
| Off-Road | 2.0516 | 19.3417 | 13.0433 | 0.0218 | | 1.0621 | 1.0621 | | 0.9964 | 0.9964 | | 2,093.4096 | 2,093.4096 | 0.5112 | | 2,106.1907 |
| **Total** | **2.0516** | **19.3417** | **13.0433** | **0.0218** | **6.0246** | **1.0621** | **7.0867** | **3.3106** | **0.9964** | **4.3070** | | **2,093.4096** | **2,093.4096** | **0.5112** | | **2,106.1907** |

### 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 | 0.0135 | 0.5971 | 0.0856 | 1.8600e-003 | 0.0437 | 1.9100e-003 | 0.0457 | 0.0120 | 1.8300e-003 | 0.0138 | | 196.8895 | 196.8895 | 0.0132 | | 197.2188 |
| Vendor | 5.8800e-003 | 0.2047 | 0.0441 | 5.0000e-004 | 0.0128 | 1.1800e-003 | 0.0140 | 3.6900e-003 | 1.1300e-003 | 4.8200e-003 | | 53.0086 | 53.0086 | 4.6000e-003 | | 53.1235 |
| Worker | 0.0498 | 0.0311 | 0.3262 | 9.9000e-004 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 98.8236 | 98.8236 | 2.4500e-003 | | 98.8849 |
| **Total** | **0.0692** | **0.8330** | **0.4558** | **3.3500e-003** | **0.1683** | **3.7700e-003** | **0.1721** | **0.0453** | **3.5800e-003** | **0.0489** | | **348.7216** | **348.7216** | **0.0202** | | **349.2272** |

## 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 | | | | | 2.3496 | 0.0000 | 2.3496 | 1.2911 | 0.0000 | 1.2911 | | | 0.0000 | | | 0.0000 |
| Off-Road | 2.0516 | 19.3417 | 13.0433 | 0.0218 | | 1.0621 | 1.0621 | | 0.9964 | 0.9964 | 0.0000 | 2,093.4096 | 2,093.4096 | 0.5112 | | 2,106.1907 |
| **Total** | **2.0516** | **19.3417** | **13.0433** | **0.0218** | **2.3496** | **1.0621** | **3.4117** | **1.2911** | **0.9964** | **2.2875** | **0.0000** | **2,093.4096** | **2,093.4096** | **0.5112** | | **2,106.1907** |

## 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 | 0.0135 | 0.5971 | 0.0856 | 1.8600e-003 | 0.0437 | 1.9100e-003 | 0.0457 | 0.0120 | 1.8300e-003 | 0.0138 | | 196.8895 | 196.8895 | 0.0132 | | 197.2188 |
| Vendor | 5.8800e-003 | 0.2047 | 0.0441 | 5.0000e-004 | 0.0128 | 1.1800e-003 | 0.0140 | 3.6900e-003 | 1.1300e-003 | 4.8200e-003 | | 53.0086 | 53.0086 | 4.6000e-003 | | 53.1235 |
| Worker | 0.0498 | 0.0311 | 0.3262 | 9.9000e-004 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 98.8236 | 98.8236 | 2.4500e-003 | | 98.8849 |
| **Total** | **0.0692** | **0.8330** | **0.4558** | **3.3500e-003** | **0.1683** | **3.7700e-003** | **0.1721** | **0.0453** | **3.5800e-003** | **0.0489** | | **348.7216** | **348.7216** | **0.0202** | | **349.2272** |

## 3.4 Tank Construction - 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 | 1.1490 | 10.3655 | 7.3423 | 0.0130 | | 0.5389 | 0.5389 | | 0.5028 | 0.5028 | | 1,215.0667 | 1,215.0667 | 0.3565 | | 1,223.9802 |
| **Total** | **1.1490** | **10.3655** | **7.3423** | **0.0130** | | **0.5389** | **0.5389** | | **0.5028** | **0.5028** | | **1,215.0667** | **1,215.0667** | **0.3565** | | **1,223.9802** |

### 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 | 0.0353 | 1.2282 | 0.2645 | 3.0200e-003 | 0.0768 | 7.1100e-003 | 0.0840 | 0.0221 | 6.8000e-003 | 0.0289 | | 318.0513 | 318.0513 | 0.0276 | | 318.7409 |
| Worker | 0.0748 | 0.0467 | 0.4893 | 1.4900e-003 | 0.1677 | 1.0200e-003 | 0.1687 | 0.0445 | 9.3000e-004 | 0.0454 | | 148.2354 | 148.2354 | 3.6800e-003 | | 148.3274 |
| **Total** | **0.1100** | **1.2749** | **0.7537** | **4.5100e-003** | **0.2445** | **8.1300e-003** | **0.2526** | **0.0666** | **7.7300e-003** | **0.0743** | | **466.2867** | **466.2867** | **0.0313** | | **467.0683** |

## 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 | 1.1490 | 10.3655 | 7.3423 | 0.0130 | | 0.5389 | 0.5389 | | 0.5028 | 0.5028 | 0.0000 | 1,215.0667 | 1,215.0667 | 0.3565 | | 1,223.9802 |
| **Total** | **1.1490** | **10.3655** | **7.3423** | **0.0130** | | **0.5389** | **0.5389** | | **0.5028** | **0.5028** | **0.0000** | **1,215.0667** | **1,215.0667** | **0.3565** | | **1,223.9802** |

## 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 | 0.0353 | 1.2282 | 0.2645 | 3.0200e-003 | 0.0768 | 7.1100e-003 | 0.0840 | 0.0221 | 6.8000e-003 | 0.0289 | | 318.0513 | 318.0513 | 0.0276 | | 318.7409 |
| Worker | 0.0748 | 0.0467 | 0.4893 | 1.4900e-003 | 0.1677 | 1.0200e-003 | 0.1687 | 0.0445 | 9.3000e-004 | 0.0454 | | 148.2354 | 148.2354 | 3.6800e-003 | | 148.3274 |
| **Total** | **0.1100** | **1.2749** | **0.7537** | **4.5100e-003** | **0.2445** | **8.1300e-003** | **0.2526** | **0.0666** | **7.7300e-003** | **0.0743** | | **466.2867** | **466.2867** | **0.0313** | | **467.0683** |

## 3.5 Booster Station - 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 | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.2906 | 12.9004 | 10.3613 | 0.0182 | | 0.6867 | 0.6867 | | 0.6476 | 0.6476 | | 1,752.9913 | 1,752.9913 | 0.4128 | | 1,763.3117 |
| **Total** | **1.2906** | **12.9004** | **10.3613** | **0.0182** | **0.0000** | **0.6867** | **0.6867** | **0.0000** | **0.6476** | **0.6476** | | **1,752.9913** | **1,752.9913** | **0.4128** | | **1,763.3117** |

### 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 | 0.0118 | 0.4094 | 0.0882 | 1.0100e-003 | 0.0256 | 2.3700e-003 | 0.0280 | 7.3700e-003 | 2.2700e-003 | 9.6400e-003 | | 106.0171 | 106.0171 | 9.1900e-003 | | 106.2470 |
| Worker | 0.0498 | 0.0311 | 0.3262 | 9.9000e-004 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 98.8236 | 98.8236 | 2.4500e-003 | | 98.8849 |
| **Total** | **0.0616** | **0.4405** | **0.4143** | **2.0000e-003** | **0.1374** | **3.0500e-003** | **0.1404** | **0.0370** | **2.8900e-003** | **0.0399** | | **204.8407** | **204.8407** | **0.0116** | | **205.1319** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.2906 | 12.9004 | 10.3613 | 0.0182 | | 0.6867 | 0.6867 | | 0.6476 | 0.6476 | 0.0000 | 1,752.9913 | 1,752.9913 | 0.4128 | | 1,763.3117 |
| **Total** | **1.2906** | **12.9004** | **10.3613** | **0.0182** | **0.0000** | **0.6867** | **0.6867** | **0.0000** | **0.6476** | **0.6476** | **0.0000** | **1,752.9913** | **1,752.9913** | **0.4128** | | **1,763.3117** |

## 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 | 0.0118 | 0.4094 | 0.0882 | 1.0100e-003 | 0.0256 | 2.3700e-003 | 0.0280 | 7.3700e-003 | 2.2700e-003 | 9.6400e-003 | | 106.0171 | 106.0171 | 9.1900e-003 | | 106.2470 |
| Worker | 0.0498 | 0.0311 | 0.3262 | 9.9000e-004 | 0.1118 | 6.8000e-004 | 0.1125 | 0.0296 | 6.2000e-004 | 0.0303 | | 98.8236 | 98.8236 | 2.4500e-003 | | 98.8849 |
| **Total** | **0.0616** | **0.4405** | **0.4143** | **2.0000e-003** | **0.1374** | **3.0500e-003** | **0.1404** | **0.0370** | **2.8900e-003** | **0.0399** | | **204.8407** | **204.8407** | **0.0116** | | **205.1319** |

## 3.6 Tank Coating - 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 | | | | | |
| Archit. Coating | 6.8262 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5924 | 12.8322 | 13.7296 | 0.0237 | | 0.7695 | 0.7695 | | 0.7695 | 0.7695 | | 2,244.3678 | 2,244.3678 | 0.1409 | | 2,247.8897 |
| **Total** | **8.4187** | **12.8322** | **13.7296** | **0.0237** | | **0.7695** | **0.7695** | | **0.7695** | **0.7695** | | **2,244.3678** | **2,244.3678** | **0.1409** | | **2,247.8897** |

### 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 | 0.0118 | 0.4094 | 0.0882 | 1.0100e-003 | 0.0256 | 2.3700e-003 | 0.0280 | 7.3700e-003 | 2.2700e-003 | 9.6400e-003 | | 106.0171 | 106.0171 | 9.1900e-003 | | 106.2470 |
| Worker | 0.0150 | 9.3400e-003 | 0.0979 | 3.0000e-004 | 0.0335 | 2.0000e-004 | 0.0337 | 8.8900e-003 | 1.9000e-004 | 9.0800e-003 | | 29.6471 | 29.6471 | 7.4000e-004 | | 29.6655 |
| **Total** | **0.0267** | **0.4188** | **0.1860** | **1.3100e-003** | **0.0591** | **2.5700e-003** | **0.0617** | **0.0163** | **2.4600e-003** | **0.0187** | | **135.6642** | **135.6642** | **9.9300e-003** | | **135.9124** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 6.8262 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5924 | 12.8322 | 13.7296 | 0.0237 | | 0.7695 | 0.7695 | | 0.7695 | 0.7695 | 0.0000 | 2,244.3678 | 2,244.3678 | 0.1409 | | 2,247.8897 |
| **Total** | **8.4187** | **12.8322** | **13.7296** | **0.0237** | | **0.7695** | **0.7695** | | **0.7695** | **0.7695** | **0.0000** | **2,244.3678** | **2,244.3678** | **0.1409** | | **2,247.8897** |

## 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 | 0.0118 | 0.4094 | 0.0882 | 1.0100e-003 | 0.0256 | 2.3700e-003 | 0.0280 | 7.3700e-003 | 2.2700e-003 | 9.6400e-003 | | 106.0171 | 106.0171 | 9.1900e-003 | | 106.2470 |
| Worker | 0.0150 | 9.3400e-003 | 0.0979 | 3.0000e-004 | 0.0335 | 2.0000e-004 | 0.0337 | 8.8900e-003 | 1.9000e-004 | 9.0800e-003 | | 29.6471 | 29.6471 | 7.4000e-004 | | 29.6655 |
| **Total** | **0.0267** | **0.4188** | **0.1860** | **1.3100e-003** | **0.0591** | **2.5700e-003** | **0.0617** | **0.0163** | **2.4600e-003** | **0.0187** | | **135.6642** | **135.6642** | **9.9300e-003** | | **135.9124** |

## 3.7 Pipe Work - 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 | 0.2095 | 2.1052 | 2.2797 | 3.1100e-003 | | 0.1331 | 0.1331 | | 0.1225 | 0.1225 | | 300.7685 | 300.7685 | 0.0973 | | 303.2004 |
| **Total** | **0.2095** | **2.1052** | **2.2797** | **3.1100e-003** | | **0.1331** | **0.1331** | | **0.1225** | **0.1225** | | **300.7685** | **300.7685** | **0.0973** | | **303.2004** |

### 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 | 0.0118 | 0.4094 | 0.0882 | 1.0100e-003 | 0.0256 | 2.3700e-003 | 0.0280 | 7.3700e-003 | 2.2700e-003 | 9.6400e-003 | | 106.0171 | 106.0171 | 9.1900e-003 | | 106.2470 |
| Worker | 0.0150 | 9.3400e-003 | 0.0979 | 3.0000e-004 | 0.0335 | 2.0000e-004 | 0.0337 | 8.8900e-003 | 1.9000e-004 | 9.0800e-003 | | 29.6471 | 29.6471 | 7.4000e-004 | | 29.6655 |
| **Total** | **0.0267** | **0.4188** | **0.1860** | **1.3100e-003** | **0.0591** | **2.5700e-003** | **0.0617** | **0.0163** | **2.4600e-003** | **0.0187** | | **135.6642** | **135.6642** | **9.9300e-003** | | **135.9124** |

## 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 | 0.2095 | 2.1052 | 2.2797 | 3.1100e-003 | | 0.1331 | 0.1331 | | 0.1225 | 0.1225 | 0.0000 | 300.7685 | 300.7685 | 0.0973 | | 303.2004 |
| **Total** | **0.2095** | **2.1052** | **2.2797** | **3.1100e-003** | | **0.1331** | **0.1331** | | **0.1225** | **0.1225** | **0.0000** | **300.7685** | **300.7685** | **0.0973** | | **303.2004** |

## 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 | 0.0118 | 0.4094 | 0.0882 | 1.0100e-003 | 0.0256 | 2.3700e-003 | 0.0280 | 7.3700e-003 | 2.2700e-003 | 9.6400e-003 | | 106.0171 | 106.0171 | 9.1900e-003 | | 106.2470 |
| Worker | 0.0150 | 9.3400e-003 | 0.0979 | 3.0000e-004 | 0.0335 | 2.0000e-004 | 0.0337 | 8.8900e-003 | 1.9000e-004 | 9.0800e-003 | | 29.6471 | 29.6471 | 7.4000e-004 | | 29.6655 |
| **Total** | **0.0267** | **0.4188** | **0.1860** | **1.3100e-003** | **0.0591** | **2.5700e-003** | **0.0617** | **0.0163** | **2.4600e-003** | **0.0187** | | **135.6642** | **135.6642** | **9.9300e-003** | | **135.9124** |

## 3.8 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 | 0.6803 | 6.9966 | 7.0714 | 0.0104 | | 0.4024 | 0.4024 | | 0.3702 | 0.3702 | | 1,010.1070 | 1,010.1070 | 0.3267 | | 1,018.2743 |
| Paving | 0.2620 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.9423** | **6.9966** | **7.0714** | **0.0104** | | **0.4024** | **0.4024** | | **0.3702** | **0.3702** | | **1,010.1070** | **1,010.1070** | **0.3267** | | **1,018.2743** |

### 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 | 0.0399 | 0.0249 | 0.2609 | 7.9000e-004 | 0.0894 | 5.4000e-004 | 0.0900 | 0.0237 | 5.0000e-004 | 0.0242 | | 79.0589 | 79.0589 | 1.9600e-003 | | 79.1080 |
| **Total** | **0.0399** | **0.0249** | **0.2609** | **7.9000e-004** | **0.0894** | **5.4000e-004** | **0.0900** | **0.0237** | **5.0000e-004** | **0.0242** | | **79.0589** | **79.0589** | **1.9600e-003** | | **79.1080** |

## 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 | 0.6803 | 6.9966 | 7.0714 | 0.0104 | | 0.4024 | 0.4024 | | 0.3702 | 0.3702 | 0.0000 | 1,010.1070 | 1,010.1070 | 0.3267 | | 1,018.2743 |
| Paving | 0.2620 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.9423** | **6.9966** | **7.0714** | **0.0104** | | **0.4024** | **0.4024** | | **0.3702** | **0.3702** | **0.0000** | **1,010.1070** | **1,010.1070** | **0.3267** | | **1,018.2743** |

## 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 | 0.0399 | 0.0249 | 0.2609 | 7.9000e-004 | 0.0894 | 5.4000e-004 | 0.0900 | 0.0237 | 5.0000e-004 | 0.0242 | | 79.0589 | 79.0589 | 1.9600e-003 | | 79.1080 |
| **Total** | **0.0399** | **0.0249** | **0.2609** | **7.9000e-004** | **0.0894** | **5.4000e-004** | **0.0900** | **0.0237** | **5.0000e-004** | **0.0242** | | **79.0589** | **79.0589** | **1.9600e-003** | | **79.1080** |

# Benedict Reservoir and Armstrong Booster Station

**Riverside-South Coast County, Annual**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.50 | Acre | 0.50 | 21,780.00 | 0 |
| Other Non-Asphalt Surfaces | 0.30 | Acre | 0.30 | 13,068.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.4 | **Precipitation Freq (Days)** | 28 |
| **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 - Site Plan
Construction Phase - Per Engineer
Off-road Equipment - 8 hours/day
Off-road Equipment - Per Engineer; 8 hours/day
Off-road Equipment - 8 hours/day
Off-road Equipment - 8 hour/day
Off-road Equipment - 8 hours/day
Off-road Equipment - Per Engineer
Off-road Equipment - Per Engineer; 8 hours per day
Off-road Equipment - Per Engineer

Trips and VMT - Added 4 vendor trips for material delivery to tank construction, booster station, tank coating, and pipe work; 2 vendor trips for water truck to grading; 2 addtional vendor trips to tank construcion for water truck; 10 vendor trips to demo
Demolition -
Grading - Per Engineer
Construction Off-road Equipment Mitigation - Per Rule 403
Architectural Coating - Site Plan

Benedict Reservoir and Armstrong Booster Station - Riverside-South Coast County, Annual

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblArchitecturalCoating | ConstArea_Nonresidential_Exterior | 0.00 | 26,006.00 |
| tblArchitecturalCoating | ConstArea_Nonresidential_Interior | 0.00 | 38,177.00 |
| tblConstructionPhase | NumDays | 5.00 | 45.00 |
| tblConstructionPhase | NumDays | 100.00 | 120.00 |
| tblConstructionPhase | NumDays | 2.00 | 30.00 |
| tblConstructionPhase | NumDays | 2.00 | 50.00 |
| tblGrading | MaterialExported | 0.00 | 100.00 |
| tblGrading | MaterialImported | 0.00 | 500.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 4.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 1.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 1.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 6.00 | 8.00 |
| tblOffRoadEquipment | UsageHours | 7.00 | 8.00 |
| tblTripsAndVMT | VendorTripLength | 6.90 | 20.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 10.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 6.00 | 12.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | VendorVehicleClass | HDT_Mix | HHDT |

# 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 | | | | | |
| 2020 | 0.3466 | 1.7966 | 1.3920 | 2.7400e-003 | 0.1145 | 0.0916 | 0.2061 | 0.0562 | 0.0869 | 0.1431 | 0.0000 | 240.3120 | 240.3120 | 0.0456 | 0.0000 | 241.4530 |
| **Maximum** | **0.3466** | **1.7966** | **1.3920** | **2.7400e-003** | **0.1145** | **0.0916** | **0.2061** | **0.0562** | **0.0869** | **0.1431** | **0.0000** | **240.3120** | **240.3120** | **0.0456** | **0.0000** | **241.4530** |

**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 | | | | | |
| 2020 | 0.3466 | 1.7966 | 1.3920 | 2.7400e-003 | 0.0594 | 0.0916 | 0.1510 | 0.0259 | 0.0869 | 0.1128 | 0.0000 | 240.3118 | 240.3118 | 0.0456 | 0.0000 | 241.4527 |
| **Maximum** | **0.3466** | **1.7966** | **1.3920** | **2.7400e-003** | **0.0594** | **0.0916** | **0.1510** | **0.0259** | **0.0869** | **0.1128** | **0.0000** | **240.3118** | **240.3118** | **0.0456** | **0.0000** | **241.4527** |

| | **ROG** | **NOx** | **CO** | **SO2** | **Fugitive PM10** | **Exhaust PM10** | **PM10 Total** | **Fugitive PM2.5** | **Exhaust PM2.5** | **PM2.5 Total** | **Bio- CO2** | **NBio-CO2** | **Total CO2** | **CH4** | **N20** | **CO2e** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **48.15** | **0.00** | **26.75** | **53.88** | **0.00** | **21.17** | **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** | **1-20-2020** | **4-19-2020** | 0.6047 | 0.6047 |
| **2** | **4-20-2020** | **7-19-2020** | 0.4194 | 0.4194 |
| **3** | **7-20-2020** | **9-30-2020** | 0.7602 | 0.7602 |
| | | **Highest** | 0.7602 | 0.7602 |

## 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 | 1/20/2020 | 1/31/2020 | 5 | 10 | |
| 2 | Grading | Grading | 2/1/2020 | 3/13/2020 | 5 | 30 | |
| 3 | Tank Construction | Building Construction | 3/14/2020 | 8/28/2020 | 5 | 120 | |
| 4 | Booster Station | Grading | 8/1/2020 | 10/9/2020 | 5 | 50 | |
| 5 | Tank Coating | Architectural Coating | 8/29/2020 | 10/30/2020 | 5 | 45 | |
| 6 | Pipe Work | Trenching | 11/1/2020 | 12/11/2020 | 5 | 30 | |
| 7 | Paving | Paving | 12/12/2020 | 12/19/2020 | 5 | 5 | |

**Acres of Grading (Site Preparation Phase): 0**
**Acres of Grading (Grading Phase): 0**
**Acres of Paving: 0.8**
**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 38,177; Non-Residential Outdoor: 26,006; Striped Parking Area: 2,091**

**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 | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Demolition | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Grading | Concrete/Industrial Saws | 0 | 8.00 | 81 | 0.73 |
| Grading | Crushing/Proc. Equipment | 1 | 8.00 | 85 | 0.78 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Tank Construction | Cranes | 1 | 8.00 | 231 | 0.29 |
| Tank Construction | Forklifts | 1 | 8.00 | 89 | 0.20 |
| Tank Construction | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Tank Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Booster Station | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Booster Station | Cranes | 1 | 8.00 | 231 | 0.29 |
| Booster Station | Rubber Tired Dozers | 0 | 1.00 | 247 | 0.40 |
| Booster Station | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Tank Coating | Air Compressors | 1 | 8.00 | 78 | 0.48 |
| Tank Coating | Pumps | 1 | 24.00 | 84 | 0.74 |
| Pipe Work | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Paving | Cement and Mortar Mixers | 0 | 6.00 | 9 | 0.56 |
| Paving | Pavers | 1 | 8.00 | 130 | 0.42 |
| Paving | Rollers | 1 | 8.00 | 80 | 0.38 |
| Paving | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |

**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 | 4 | 10.00 | 10.00 | 0.00 | 14.70 | 20.00 | 20.00 | LD_Mix | HHDT | HHDT |
| Grading | 4 | 10.00 | 2.00 | 75.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Tank Construction | 4 | 15.00 | 12.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Booster Station | 4 | 10.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Tank Coating | 2 | 3.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Pipe Work | 1 | 3.00 | 4.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 8.00 | 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 - 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 | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 9.5800e-003 | 0.0942 | 0.0619 | 1.0000e-004 | | 5.1000e-003 | 5.1000e-003 | | 4.7700e-003 | 4.7700e-003 | 0.0000 | 9.1696 | 9.1696 | 2.2700e-003 | 0.0000 | 9.2262 |
| **Total** | **9.5800e-003** | **0.0942** | **0.0619** | **1.0000e-004** | **0.0000** | **5.1000e-003** | **5.1000e-003** | **0.0000** | **4.7700e-003** | **4.7700e-003** | **0.0000** | **9.1696** | **9.1696** | **2.2700e-003** | **0.0000** | **9.2262** |

**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 | 2.6000e-004 | 0.0121 | 1.5700e-003 | 4.0000e-005 | 8.6000e-004 | 4.0000e-005 | 9.0000e-004 | 2.4000e-004 | 4.0000e-005 | 2.7000e-004 | 0.0000 | 3.6255 | 3.6255 | 2.3000e-004 | 0.0000 | 3.6312 |
| Worker | 2.3000e-004 | 1.6000e-004 | 1.7200e-003 | 1.0000e-005 | 5.5000e-004 | 0.0000 | 5.5000e-004 | 1.5000e-004 | 0.0000 | 1.5000e-004 | 0.0000 | 0.4598 | 0.4598 | 1.0000e-005 | 0.0000 | 0.4601 |
| **Total** | **4.9000e-004** | **0.0123** | **3.2900e-003** | **5.0000e-005** | **1.4100e-003** | **4.0000e-005** | **1.4500e-003** | **3.9000e-004** | **4.0000e-005** | **4.2000e-004** | **0.0000** | **4.0853** | **4.0853** | **2.4000e-004** | **0.0000** | **4.0912** |

**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 | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 9.5800e-003 | 0.0942 | 0.0619 | 1.0000e-004 | | 5.1000e-003 | 5.1000e-003 | | 4.7700e-003 | 4.7700e-003 | 0.0000 | 9.1696 | 9.1696 | 2.2700e-003 | 0.0000 | 9.2262 |
| **Total** | **9.5800e-003** | **0.0942** | **0.0619** | **1.0000e-004** | **0.0000** | **5.1000e-003** | **5.1000e-003** | **0.0000** | **4.7700e-003** | **4.7700e-003** | **0.0000** | **9.1696** | **9.1696** | **2.2700e-003** | **0.0000** | **9.2262** |

**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 | 2.6000e-004 | 0.0121 | 1.5700e-003 | 4.0000e-005 | 8.6000e-004 | 4.0000e-005 | 9.0000e-004 | 2.4000e-004 | 4.0000e-005 | 2.7000e-004 | 0.0000 | 3.6255 | 3.6255 | 2.3000e-004 | 0.0000 | 3.6312 |
| Worker | 2.3000e-004 | 1.6000e-004 | 1.7200e-003 | 1.0000e-005 | 5.5000e-004 | 0.0000 | 5.5000e-004 | 1.5000e-004 | 0.0000 | 1.5000e-004 | 0.0000 | 0.4598 | 0.4598 | 1.0000e-005 | 0.0000 | 0.4601 |
| **Total** | **4.9000e-004** | **0.0123** | **3.2900e-003** | **5.0000e-005** | **1.4100e-003** | **4.0000e-005** | **1.4500e-003** | **3.9000e-004** | **4.0000e-005** | **4.2000e-004** | **0.0000** | **4.0853** | **4.0853** | **2.4000e-004** | **0.0000** | **4.0912** |

## 3.3 Grading - 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 | | | | | |
| Fugitive Dust | | | | | 0.0904 | 0.0000 | 0.0904 | 0.0497 | 0.0000 | 0.0497 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0308 | 0.2901 | 0.1957 | 3.3000e-004 | | 0.0159 | 0.0159 | | 0.0150 | 0.0150 | 0.0000 | 28.4866 | 28.4866 | 6.9600e-003 | 0.0000 | 28.6606 |
| **Total** | **0.0308** | **0.2901** | **0.1957** | **3.3000e-004** | **0.0904** | **0.0159** | **0.1063** | **0.0497** | **0.0150** | **0.0646** | **0.0000** | **28.4866** | **28.4866** | **6.9600e-003** | **0.0000** | **28.6606** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 2.0000e-004 | 9.0900e-003 | 1.1800e-003 | 3.0000e-005 | 6.5000e-004 | 3.0000e-005 | 6.7000e-004 | 1.8000e-004 | 3.0000e-005 | 2.0000e-004 | 0.0000 | 2.7191 | 2.7191 | 1.7000e-004 | 0.0000 | 2.7234 |
| Vendor | 9.0000e-005 | 3.1200e-003 | 6.1000e-004 | 1.0000e-005 | 1.9000e-004 | 2.0000e-005 | 2.1000e-004 | 5.0000e-005 | 2.0000e-005 | 7.0000e-005 | 0.0000 | 0.7377 | 0.7377 | 6.0000e-005 | 0.0000 | 0.7391 |
| Worker | 6.9000e-004 | 4.8000e-004 | 5.1600e-003 | 2.0000e-005 | 1.6500e-003 | 1.0000e-005 | 1.6600e-003 | 4.4000e-004 | 1.0000e-005 | 4.5000e-004 | 0.0000 | 1.3794 | 1.3794 | 3.0000e-005 | 0.0000 | 1.3803 |
| **Total** | **9.8000e-004** | **0.0127** | **6.9500e-003** | **6.0000e-005** | **2.4900e-003** | **6.0000e-005** | **2.5400e-003** | **6.7000e-004** | **6.0000e-005** | **7.2000e-004** | **0.0000** | **4.8362** | **4.8362** | **2.6000e-004** | **0.0000** | **4.8428** |

**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 | | | | | 0.0352 | 0.0000 | 0.0352 | 0.0194 | 0.0000 | 0.0194 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0308 | 0.2901 | 0.1957 | 3.3000e-004 | | 0.0159 | 0.0159 | | 0.0150 | 0.0150 | 0.0000 | 28.4866 | 28.4866 | 6.9600e-003 | 0.0000 | 28.6605 |
| **Total** | **0.0308** | **0.2901** | **0.1957** | **3.3000e-004** | **0.0352** | **0.0159** | **0.0512** | **0.0194** | **0.0150** | **0.0343** | **0.0000** | **28.4866** | **28.4866** | **6.9600e-003** | **0.0000** | **28.6605** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 2.0000e-004 | 9.0900e-003 | 1.1800e-003 | 3.0000e-005 | 6.5000e-004 | 3.0000e-005 | 6.7000e-004 | 1.8000e-004 | 3.0000e-005 | 2.0000e-004 | 0.0000 | 2.7191 | 2.7191 | 1.7000e-004 | 0.0000 | 2.7234 |
| Vendor | 9.0000e-005 | 3.1200e-003 | 6.1000e-004 | 1.0000e-005 | 1.9000e-004 | 2.0000e-005 | 2.1000e-004 | 5.0000e-005 | 2.0000e-005 | 7.0000e-005 | 0.0000 | 0.7377 | 0.7377 | 6.0000e-005 | 0.0000 | 0.7391 |
| Worker | 6.9000e-004 | 4.8000e-004 | 5.1600e-003 | 2.0000e-005 | 1.6500e-003 | 1.0000e-005 | 1.6600e-003 | 4.4000e-004 | 1.0000e-005 | 4.5000e-004 | 0.0000 | 1.3794 | 1.3794 | 3.0000e-005 | 0.0000 | 1.3803 |
| **Total** | **9.8000e-004** | **0.0127** | **6.9500e-003** | **6.0000e-005** | **2.4900e-003** | **6.0000e-005** | **2.5400e-003** | **6.7000e-004** | **6.0000e-005** | **7.2000e-004** | **0.0000** | **4.8362** | **4.8362** | **2.6000e-004** | **0.0000** | **4.8428** |

## 3.4 Tank Construction - 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 | 0.0689 | 0.6219 | 0.4405 | 7.8000e-004 | | 0.0323 | 0.0323 | | 0.0302 | 0.0302 | 0.0000 | 66.1374 | 66.1374 | 0.0194 | 0.0000 | 66.6226 |
| **Total** | **0.0689** | **0.6219** | **0.4405** | **7.8000e-004** | | **0.0323** | **0.0323** | | **0.0302** | **0.0302** | **0.0000** | **66.1374** | **66.1374** | **0.0194** | **0.0000** | **66.6226** |

### 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 | 2.0500e-003 | 0.0749 | 0.0147 | 1.9000e-004 | 4.5500e-003 | 4.2000e-004 | 4.9700e-003 | 1.3100e-003 | 4.1000e-004 | 1.7200e-003 | 0.0000 | 17.7039 | 17.7039 | 1.4200e-003 | 0.0000 | 17.7393 |
| Worker | 4.1400e-003 | 2.9000e-003 | 0.0310 | 9.0000e-005 | 9.8900e-003 | 6.0000e-005 | 9.9500e-003 | 2.6300e-003 | 6.0000e-005 | 2.6800e-003 | 0.0000 | 8.2763 | 8.2763 | 2.1000e-004 | 0.0000 | 8.2815 |
| **Total** | **6.1900e-003** | **0.0778** | **0.0456** | **2.8000e-004** | **0.0144** | **4.8000e-004** | **0.0149** | **3.9400e-003** | **4.7000e-004** | **4.4000e-003** | **0.0000** | **25.9802** | **25.9802** | **1.6300e-003** | **0.0000** | **26.0208** |

**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 | 0.0689 | 0.6219 | 0.4405 | 7.8000e-004 | | 0.0323 | 0.0323 | | 0.0302 | 0.0302 | 0.0000 | 66.1373 | 66.1373 | 0.0194 | 0.0000 | 66.6225 |
| **Total** | **0.0689** | **0.6219** | **0.4405** | **7.8000e-004** | | **0.0323** | **0.0323** | | **0.0302** | **0.0302** | **0.0000** | **66.1373** | **66.1373** | **0.0194** | **0.0000** | **66.6225** |

**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 | 2.0500e-003 | 0.0749 | 0.0147 | 1.9000e-004 | 4.5500e-003 | 4.2000e-004 | 4.9700e-003 | 1.3100e-003 | 4.1000e-004 | 1.7200e-003 | 0.0000 | 17.7039 | 17.7039 | 1.4200e-003 | 0.0000 | 17.7393 |
| Worker | 4.1400e-003 | 2.9000e-003 | 0.0310 | 9.0000e-005 | 9.8900e-003 | 6.0000e-005 | 9.9500e-003 | 2.6300e-003 | 6.0000e-005 | 2.6800e-003 | 0.0000 | 8.2763 | 8.2763 | 2.1000e-004 | 0.0000 | 8.2815 |
| **Total** | **6.1900e-003** | **0.0778** | **0.0456** | **2.8000e-004** | **0.0144** | **4.8000e-004** | **0.0149** | **3.9400e-003** | **4.7000e-004** | **4.4000e-003** | **0.0000** | **25.9802** | **25.9802** | **1.6300e-003** | **0.0000** | **26.0208** |

## 3.5 Booster Station - 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 | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0323 | 0.3225 | 0.2590 | 4.6000e-004 | | 0.0172 | 0.0172 | | 0.0162 | 0.0162 | 0.0000 | 39.7572 | 39.7572 | 9.3600e-003 | 0.0000 | 39.9912 |
| **Total** | **0.0323** | **0.3225** | **0.2590** | **4.6000e-004** | **0.0000** | **0.0172** | **0.0172** | **0.0000** | **0.0162** | **0.0162** | **0.0000** | **39.7572** | **39.7572** | **9.3600e-003** | **0.0000** | **39.9912** |

### 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 | 2.8000e-004 | 0.0104 | 2.0300e-003 | 3.0000e-005 | 6.3000e-004 | 6.0000e-005 | 6.9000e-004 | 1.8000e-004 | 6.0000e-005 | 2.4000e-004 | 0.0000 | 2.4589 | 2.4589 | 2.0000e-004 | 0.0000 | 2.4638 |
| Worker | 1.1500e-003 | 8.1000e-004 | 8.6000e-003 | 3.0000e-005 | 2.7500e-003 | 2.0000e-005 | 2.7600e-003 | 7.3000e-004 | 2.0000e-005 | 7.5000e-004 | 0.0000 | 2.2990 | 2.2990 | 6.0000e-005 | 0.0000 | 2.3004 |
| **Total** | **1.4300e-003** | **0.0112** | **0.0106** | **6.0000e-005** | **3.3800e-003** | **8.0000e-005** | **3.4500e-003** | **9.1000e-004** | **8.0000e-005** | **9.9000e-004** | **0.0000** | **4.7579** | **4.7579** | **2.6000e-004** | **0.0000** | **4.7642** |

**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 | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0323 | 0.3225 | 0.2590 | 4.6000e-004 | | 0.0172 | 0.0172 | | 0.0162 | 0.0162 | 0.0000 | 39.7571 | 39.7571 | 9.3600e-003 | 0.0000 | 39.9912 |
| **Total** | **0.0323** | **0.3225** | **0.2590** | **4.6000e-004** | **0.0000** | **0.0172** | **0.0172** | **0.0000** | **0.0162** | **0.0162** | **0.0000** | **39.7571** | **39.7571** | **9.3600e-003** | **0.0000** | **39.9912** |

**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 | 2.8000e-004 | 0.0104 | 2.0300e-003 | 3.0000e-005 | 6.3000e-004 | 6.0000e-005 | 6.9000e-004 | 1.8000e-004 | 6.0000e-005 | 2.4000e-004 | 0.0000 | 2.4589 | 2.4589 | 2.0000e-004 | 0.0000 | 2.4638 |
| Worker | 1.1500e-003 | 8.1000e-004 | 8.6000e-003 | 3.0000e-005 | 2.7500e-003 | 2.0000e-005 | 2.7600e-003 | 7.3000e-004 | 2.0000e-005 | 7.5000e-004 | 0.0000 | 2.2990 | 2.2990 | 6.0000e-005 | 0.0000 | 2.3004 |
| **Total** | **1.4300e-003** | **0.0112** | **0.0106** | **6.0000e-005** | **3.3800e-003** | **8.0000e-005** | **3.4500e-003** | **9.1000e-004** | **8.0000e-005** | **9.9000e-004** | **0.0000** | **4.7579** | **4.7579** | **2.6000e-004** | **0.0000** | **4.7642** |

## 3.6 Tank Coating - 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 | | | | | |
| Archit. Coating | 0.1536 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0358 | 0.2887 | 0.3089 | 5.3000e-004 | | 0.0173 | 0.0173 | | 0.0173 | 0.0173 | 0.0000 | 45.8113 | 45.8113 | 2.8800e-003 | 0.0000 | 45.8832 |
| **Total** | **0.1894** | **0.2887** | **0.3089** | **5.3000e-004** | | **0.0173** | **0.0173** | | **0.0173** | **0.0173** | **0.0000** | **45.8113** | **45.8113** | **2.8800e-003** | **0.0000** | **45.8832** |

**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 | 2.6000e-004 | 9.3600e-003 | 1.8300e-003 | 2.0000e-005 | 5.7000e-004 | 5.0000e-005 | 6.2000e-004 | 1.6000e-004 | 5.0000e-005 | 2.1000e-004 | 0.0000 | 2.2130 | 2.2130 | 1.8000e-004 | 0.0000 | 2.2174 |
| Worker | 3.1000e-004 | 2.2000e-004 | 2.3200e-003 | 1.0000e-005 | 7.4000e-004 | 0.0000 | 7.5000e-004 | 2.0000e-004 | 0.0000 | 2.0000e-004 | 0.0000 | 0.6207 | 0.6207 | 2.0000e-005 | 0.0000 | 0.6211 |
| **Total** | **5.7000e-004** | **9.5800e-003** | **4.1500e-003** | **3.0000e-005** | **1.3100e-003** | **5.0000e-005** | **1.3700e-003** | **3.6000e-004** | **5.0000e-005** | **4.1000e-004** | **0.0000** | **2.8337** | **2.8337** | **2.0000e-004** | **0.0000** | **2.8385** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.1536 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0358 | 0.2887 | 0.3089 | 5.3000e-004 | | 0.0173 | 0.0173 | | 0.0173 | 0.0173 | 0.0000 | 45.8112 | 45.8112 | 2.8800e-003 | 0.0000 | 45.8831 |
| **Total** | **0.1894** | **0.2887** | **0.3089** | **5.3000e-004** | | **0.0173** | **0.0173** | | **0.0173** | **0.0173** | **0.0000** | **45.8112** | **45.8112** | **2.8800e-003** | **0.0000** | **45.8831** |

**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 | 2.6000e-004 | 9.3600e-003 | 1.8300e-003 | 2.0000e-005 | 5.7000e-004 | 5.0000e-005 | 6.2000e-004 | 1.6000e-004 | 5.0000e-005 | 2.1000e-004 | 0.0000 | 2.2130 | 2.2130 | 1.8000e-004 | 0.0000 | 2.2174 |
| Worker | 3.1000e-004 | 2.2000e-004 | 2.3200e-003 | 1.0000e-005 | 7.4000e-004 | 0.0000 | 7.5000e-004 | 2.0000e-004 | 0.0000 | 2.0000e-004 | 0.0000 | 0.6207 | 0.6207 | 2.0000e-005 | 0.0000 | 0.6211 |
| **Total** | **5.7000e-004** | **9.5800e-003** | **4.1500e-003** | **3.0000e-005** | **1.3100e-003** | **5.0000e-005** | **1.3700e-003** | **3.6000e-004** | **5.0000e-005** | **4.1000e-004** | **0.0000** | **2.8337** | **2.8337** | **2.0000e-004** | **0.0000** | **2.8385** |

## 3.7 Pipe Work - 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 | 3.1400e-003 | 0.0316 | 0.0342 | 5.0000e-005 | | 2.0000e-003 | 2.0000e-003 | | 1.8400e-003 | 1.8400e-003 | 0.0000 | 4.0928 | 4.0928 | 1.3200e-003 | 0.0000 | 4.1259 |
| **Total** | **3.1400e-003** | **0.0316** | **0.0342** | **5.0000e-005** | | **2.0000e-003** | **2.0000e-003** | | **1.8400e-003** | **1.8400e-003** | **0.0000** | **4.0928** | **4.0928** | **1.3200e-003** | **0.0000** | **4.1259** |

**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 | 1.7000e-004 | 6.2400e-003 | 1.2200e-003 | 2.0000e-005 | 3.8000e-004 | 4.0000e-005 | 4.1000e-004 | 1.1000e-004 | 3.0000e-005 | 1.4000e-004 | 0.0000 | 1.4753 | 1.4753 | 1.2000e-004 | 0.0000 | 1.4783 |
| Worker | 2.1000e-004 | 1.4000e-004 | 1.5500e-003 | 0.0000 | 4.9000e-004 | 0.0000 | 5.0000e-004 | 1.3000e-004 | 0.0000 | 1.3000e-004 | 0.0000 | 0.4138 | 0.4138 | 1.0000e-005 | 0.0000 | 0.4141 |
| **Total** | **3.8000e-004** | **6.3800e-003** | **2.7700e-003** | **2.0000e-005** | **8.7000e-004** | **4.0000e-005** | **9.1000e-004** | **2.4000e-004** | **3.0000e-005** | **2.7000e-004** | **0.0000** | **1.8892** | **1.8892** | **1.3000e-004** | **0.0000** | **1.8924** |

**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 | 3.1400e-003 | 0.0316 | 0.0342 | 5.0000e-005 | | 2.0000e-003 | 2.0000e-003 | | 1.8400e-003 | 1.8400e-003 | 0.0000 | 4.0928 | 4.0928 | 1.3200e-003 | 0.0000 | 4.1259 |
| **Total** | **3.1400e-003** | **0.0316** | **0.0342** | **5.0000e-005** | | **2.0000e-003** | **2.0000e-003** | | **1.8400e-003** | **1.8400e-003** | **0.0000** | **4.0928** | **4.0928** | **1.3200e-003** | **0.0000** | **4.1259** |

**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 | 1.7000e-004 | 6.2400e-003 | 1.2200e-003 | 2.0000e-005 | 3.8000e-004 | 4.0000e-005 | 4.1000e-004 | 1.1000e-004 | 3.0000e-005 | 1.4000e-004 | 0.0000 | 1.4753 | 1.4753 | 1.2000e-004 | 0.0000 | 1.4783 |
| Worker | 2.1000e-004 | 1.4000e-004 | 1.5500e-003 | 0.0000 | 4.9000e-004 | 0.0000 | 5.0000e-004 | 1.3000e-004 | 0.0000 | 1.3000e-004 | 0.0000 | 0.4138 | 0.4138 | 1.0000e-005 | 0.0000 | 0.4141 |
| **Total** | **3.8000e-004** | **6.3800e-003** | **2.7700e-003** | **2.0000e-005** | **8.7000e-004** | **4.0000e-005** | **9.1000e-004** | **2.4000e-004** | **3.0000e-005** | **2.7000e-004** | **0.0000** | **1.8892** | **1.8892** | **1.3000e-004** | **0.0000** | **1.8924** |

## 3.8 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 | 1.7000e-003 | 0.0175 | 0.0177 | 3.0000e-005 | | 1.0100e-003 | 1.0100e-003 | | 9.3000e-004 | 9.3000e-004 | 0.0000 | 2.2909 | 2.2909 | 7.4000e-004 | 0.0000 | 2.3094 |
| Paving | 6.6000e-004 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **2.3600e-003** | **0.0175** | **0.0177** | **3.0000e-005** | | **1.0100e-003** | **1.0100e-003** | | **9.3000e-004** | **9.3000e-004** | **0.0000** | **2.2909** | **2.2909** | **7.4000e-004** | **0.0000** | **2.3094** |

**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 | 9.0000e-005 | 6.0000e-005 | 6.9000e-004 | 0.0000 | 2.2000e-004 | 0.0000 | 2.2000e-004 | 6.0000e-005 | 0.0000 | 6.0000e-005 | 0.0000 | 0.1839 | 0.1839 | 0.0000 | 0.0000 | 0.1840 |
| **Total** | **9.0000e-005** | **6.0000e-005** | **6.9000e-004** | **0.0000** | **2.2000e-004** | **0.0000** | **2.2000e-004** | **6.0000e-005** | **0.0000** | **6.0000e-005** | **0.0000** | **0.1839** | **0.1839** | **0.0000** | **0.0000** | **0.1840** |

**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 | 1.7000e-003 | 0.0175 | 0.0177 | 3.0000e-005 | | 1.0100e-003 | 1.0100e-003 | | 9.3000e-004 | 9.3000e-004 | 0.0000 | 2.2909 | 2.2909 | 7.4000e-004 | 0.0000 | 2.3094 |
| Paving | 6.6000e-004 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **2.3600e-003** | **0.0175** | **0.0177** | **3.0000e-005** | | **1.0100e-003** | **1.0100e-003** | | **9.3000e-004** | **9.3000e-004** | **0.0000** | **2.2909** | **2.2909** | **7.4000e-004** | **0.0000** | **2.3094** |

**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 | 9.0000e-005 | 6.0000e-005 | 6.9000e-004 | 0.0000 | 2.2000e-004 | 0.0000 | 2.2000e-004 | 6.0000e-005 | 0.0000 | 6.0000e-005 | 0.0000 | 0.1839 | 0.1839 | 0.0000 | 0.0000 | 0.1840 |
| **Total** | **9.0000e-005** | **6.0000e-005** | **6.9000e-004** | **0.0000** | **2.2000e-004** | **0.0000** | **2.2000e-004** | **6.0000e-005** | **0.0000** | **6.0000e-005** | **0.0000** | **0.1839** | **0.1839** | **0.0000** | **0.0000** | **0.1840** |

# Appendix B.1

# Biological Resources Technical Report

## Jurupa Community Services District's Benedict Reservoir Project

*City of Jurupa Valley, Riverside County, California*

**DRAFT REPORT**

***Prepared for:***

Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506
Contact: Cheryl DeGano, (951) 320-6052

***Prepared by:***

**Cadre Environmental**
701 Palomar Airport Road, Suite 300
Carlsbad, CA  92011
Contact: Ruben Ramirez, (949) 300-0212

**July 2019**

CADRE Environmental

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# INTRODUCTION

The following biological resources technical report describes a detailed assessment of potential sensitive natural resources located within and/or immediately adjacent to the Jurupa Community Services District's Benedict Reservoir project site (Project Site). The report has been prepared to support compliance with the California Environmental Quality Act (CEQA) documentation. As discussed below, the assessment included a thorough literature review, site reconnaissance characterizing existing conditions (including floral, faunal and dominant vegetation communities), focused surveys for the federally threatened coastal California gnatcatcher (*Polioptila californica californica*) and sensitive plants, impact analysis, and applicable standards and regulations to ensure impacts remain at a level below significance.

## PROJECT LOCATION

The 1.07-acre Project Site (Portion of APN 174-040-020) is located within the northern region of the City of Jurupa Valley, Riverside County, California, as shown in Figure 1, *Regional Location Map*. Specifically, the Project Site extends north of Lauren Lane along an existing access route and includes the existing reservoir site and adjacent undeveloped lands as illustrated in Figure 2, *Project Site Vicinity Map*.

## PROJECT DESCRIPTION

The proposed Benedict Reservoir project entails the demolition of the existing 0.21 MG potable water storage reservoir and the construction of a new 1.1 MG potable water storage reservoir in its place. The project also includes relocation of portions of the existing fence and access road, along with the gate to accommodate the new water storage reservoir. Approximately 670 net cubic yards (cu yd) of soil would be cut and exported from the Benedict Reservoir site. Two retaining walls are also proposed; a crib wall along the northeast of the Benedict site, adjacent to the base of relocated access road, and a retaining concrete wall along the northern portion of the new 1.1 MG reservoir, in between the reservoir and the relocated access road.

The new reservoir will be made of steel, and will be approximately 90 ft. in diameter with a maximum height of 23 ft. above the finished floor elevation. The reservoir will be designed in accordance with the American Water Works Association (AWWA) D100 standards which sets guidelines for the construction of welded steel water tanks. The new water storage reservoir will have a high-water elevation of 1,205 ft., similar to the remaining 1.0 MG water reservoir. The new water storage reservoir will include standard tank appurtenances such as roof vent, roof hatch and platform, ladder, minimum ring wall, inspection covers, pressure transmitter, conduits, sampling ports and cathodic protection handholes.

## WESTERN RIVERSIDE COUNTY MULTIPLE SPECIES HABITAT CONSERVATION PLAN

The Jurupa Community Services District is not a permittee to the western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and therefore not subject to MSHCP requirements or contribution to reserve assembly goals. Regardless, to

ensure the project related impacts do not conflict with the provisions of the western Riverside County MSHCP per CEQA guidelines, an MSHCP consistency analysis was conducted and is presented in the following report in the section titled – Western Riverside County MSHCP Compliance Analysis.

The Project Site is located within the Western Riverside County MSHCP Jurupa Area Plan, within the northeast region of Criteria Cell 8, Cell Group G, as shown in Figure 3, *MSHCP Relationship Map*. The Project Site is not located within or adjacent to a linkage area or Proposed Noncontiguous Habitat Block 2.

## METHODOLOGY

The following section details the methods implemented prior to and during the reconnaissance survey and focused surveys conducted throughout the Project Site.

### LITERATURE REVIEW

Existing biological resource conditions within and adjacent to the Project Site were initially investigated through review of pertinent scientific literature. Federal register listings, protocols, and species data provided by the United States Fish and Wildlife Service (USFWS) were also reviewed in conjunction with anticipated federally listed species potentially occurring within the region of the Project Site. The California Natural Diversity Database (CNDDB) (CDFW 2018a), a California Department of Fish and Wildlife (CDFW) Natural Heritage Division species account database, was also reviewed for all pertinent information regarding the locations of known occurrences of sensitive species in the vicinity of the property. In addition, numerous regional floral and faunal field guides were utilized in the identification of species and suitable habitats. Combined, the reviewed sources provided an excellent baseline from which to inventory the biological resources potentially occurring in the region. Other CDFW reports and publications consulted include the following:

- Special Animals (CDFW 2018b);
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2018c);
- Endangered, Threatened, and Rare Plants of California (CDFW 2018d); and
- Special Vascular Plants and Bryophytes List (CDFW 2018e).

### FIELD SURVEYS

A reconnaissance survey of the Project Site was conducted by Ruben Ramirez of Cadre Environmental (USFWS Permit 780566-14, CDFW Permit 02243) on April 2nd 2019 in order to characterize and identify potential sensitive plant and wildlife habitats, and to establish the accuracy of the data identified in the literature search. Geologic and soil maps were examined to identify local soil types that may support sensitive taxa. Aerial photograph, topographic maps, vegetation and rare plant maps prepared for previous studies in the region were used to determine community types and other physical features that may support sensitive plants/wildlife, uncommon taxa, or rare communities

that occur within or adjacent to the Project Site. Habitat assessments were conducted for, but not limited to, the following target species/groups.

- Sensitive plants
- Coastal California gnatcatcher – FT/SSC
- Burrowing owl - SSC
- San Bernardino kangaroo rat – FE/SSC

### Vegetation Communities/Habitat Classification Mapping

Natural community names and hierarchical structure follows the "*Manual of California Vegetation*" (Sayer and Keeler-Wolf 2009) classification system, which has been refined and augmented where appropriate to better characterize the habitat types observed onsite.

### Floristic Plant Inventory

A general plant survey was conducted throughout the Project Site during the reconnaissance in a collective effort to identify all species occurring onsite.

All plants observed during the survey efforts were either identified in the field or collected and later identified using taxonomic keys. Plant taxonomy follows Hickman (1993). Scientific nomenclature and common names used in this report generally follow Roberts et al. (2004) or Baldwin et al. (2012) for updated taxonomy. Scientific names are included only at the first mention of a species; thereafter, common names alone are used.

### Wildlife Resources Inventory

All animals identified during the reconnaissance survey by sight, call, tracks, scat, or other characteristic sign were documented. In addition to species actually detected, expected use of the site by other wildlife was derived from the analysis of habitats on the site, combined with known habitat preferences of regionally occurring wildlife species.

Vertebrate taxonomy followed in this report is according to the Center for North American Herpetology (2019 for amphibians and reptiles), the American Ornithologists' Union (1988 and supplemental) for birds, and Baker et al. (2003) for mammals. Both common and scientific names are used during the first mention of a species; common names only are used in the remainder of the text.


Portion of APN 174-040-020

**Figure 1 - Regional Location Map**

*Biological Resources Technical Report*

*Jurupa Community Services District's Benedict Reservoir Project*

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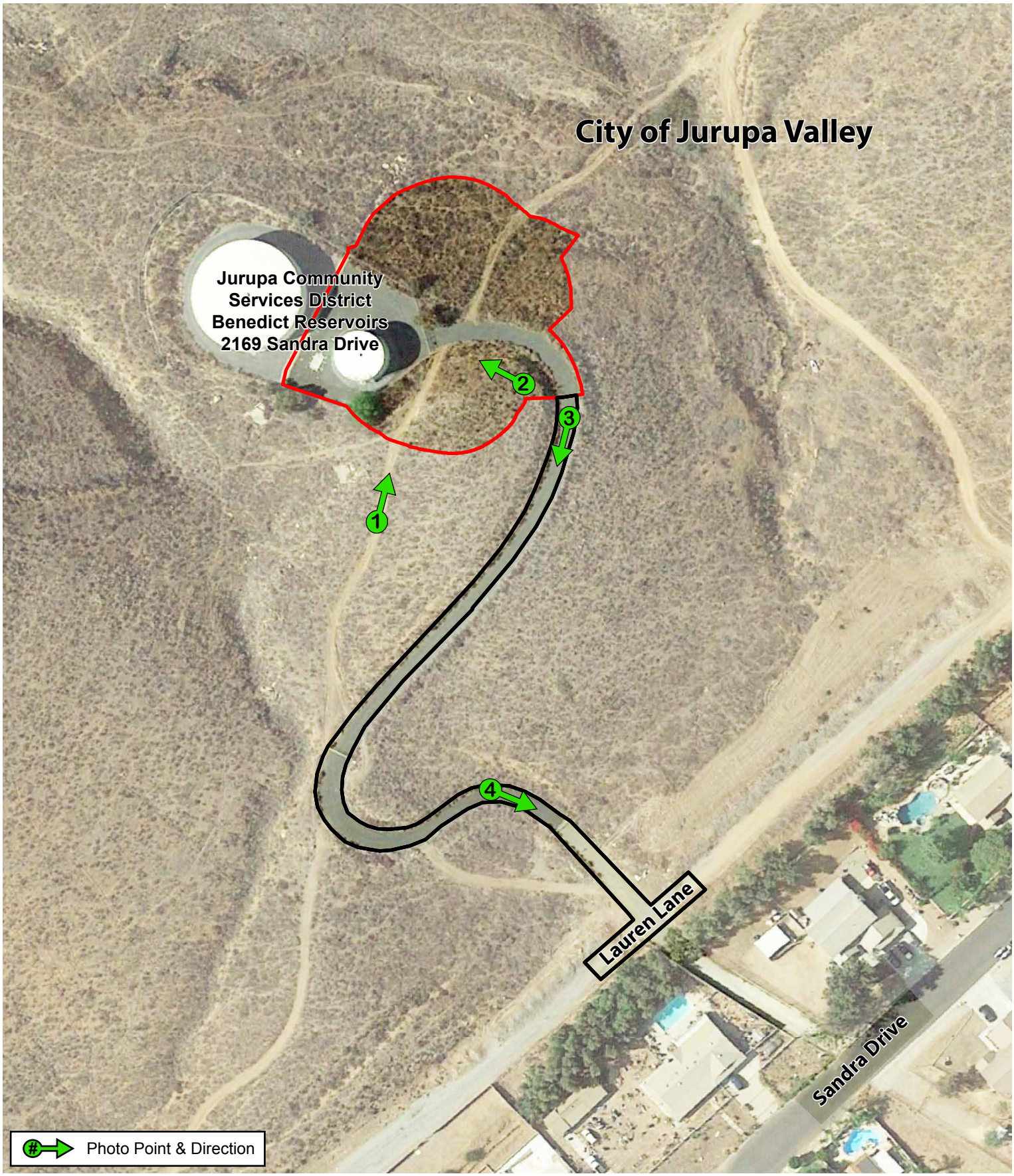
not to scale




Portion of APN 174-040-020 | Project Site | Access Route & Staging Area

**Figure 2 - Project Site Vicinity Map**

*Biological Resources Technical Report*

*Jurupa Community Services District's Benedict Reservoir Project*

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N

1 inch = 100 ft.

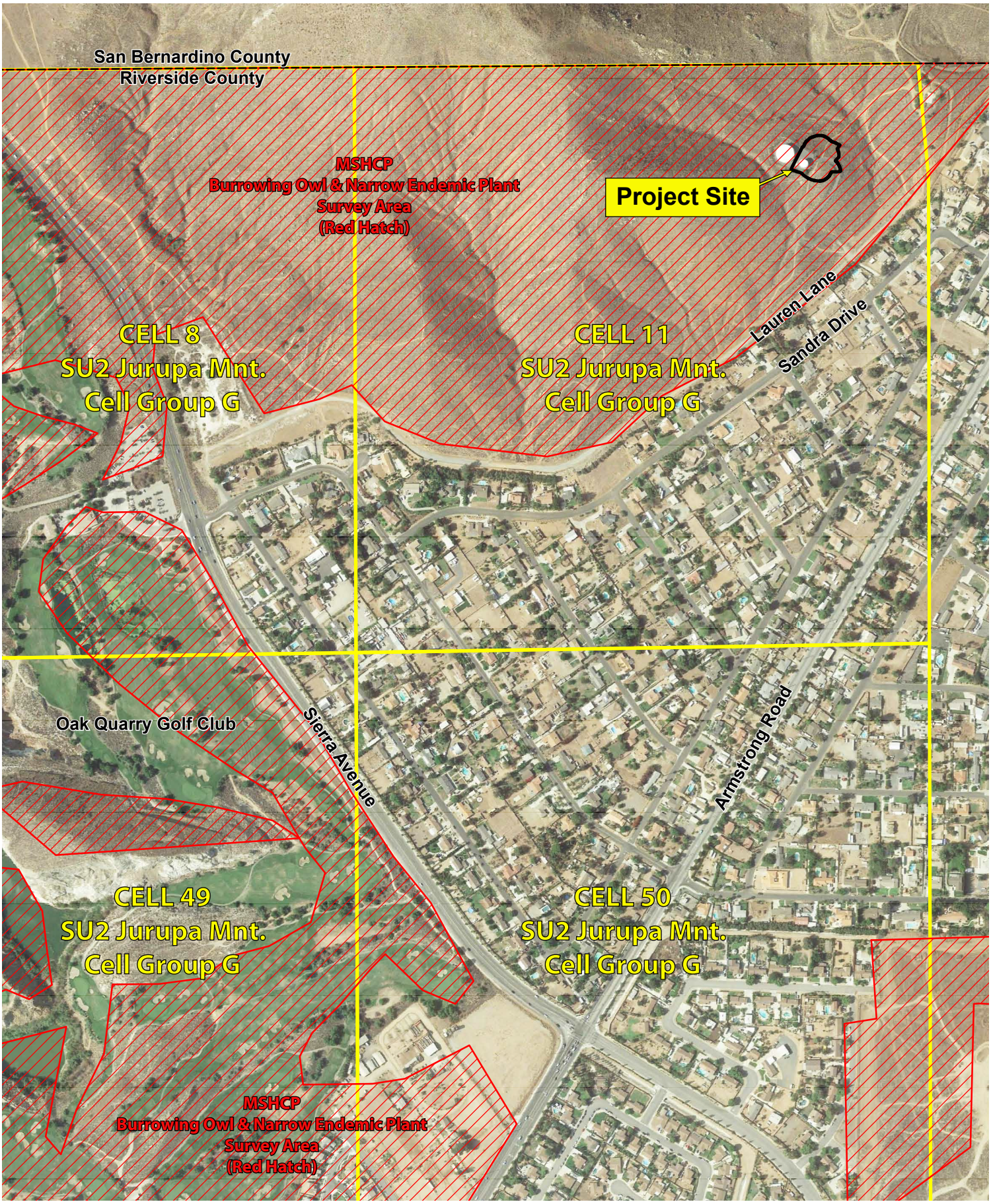


**Figure 3 - MSHCP Relationship Map**

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*Jurupa Community Services District's Benedict Reservoir Project*

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N

1 inch = 600 ft.

### Jurisdictional Resources Assessment

The Project Site was assessed for jurisdiction by the United States Army Corps of Engineers (USACE), CDFW, and Regional Water Quality Control Board (RWQCB). Non-wetland waters of the United States were assessed based on the limits of the Ordinary High-Water Mark (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in vegetation and soil characteristics. The assessment utilized the methodology for routine wetland determination according to the methods outlined in the USACE Wetland Delineation Manual (Environmental Laboratory 1987) and the Arid West Wetland Delineation Supplement and updated regulatory guidance letters (USACE 2008). Wetlands are identified by the presence of three characteristics: hydrophytic vegetation, wetland hydrology, and hydric soils. If any of these criteria were met, one or more transects were run to determine the extent of the wetland. Specifically, the presence of wetland hydrology was evaluated throughout the Project Site by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil pits, where applicable. In addition, indicators of wetland or riverine hydrology were recorded, including water marks, drift lines, rack, debris, and sediment deposits, as warranted. Any indicators of hydric soils, such as redoximorphic features, buried organic matter, organic streaking, reduced soil conditions, gleyed or low-chroma soils, or sulfidic odor were also recorded.

### Coastal California Gnatcatcher Surveys

Protocol surveys for the federally threatened/state species of special concern, coastal California gnatcatcher were performed in all areas of suitable habitat within and adjacent to the Project Site (100 ft buffer) "Survey Area". A total of approximately 5 acres of suitable habitat (Riversidean sage scrub) were surveyed. As stated by the USFWS:

> "S*urveys shall be conducted between 6:00am and 12:00pm. Surveys shall avoid periods of excessive or abnormal heat, wind, rain, or other inclement weather. Taped coastal California gnatcatcher vocalization shall be used only until individuals have been initially located. Tapes shall not be used frequently or to illicit further behaviors from the birds. Surveys shall be conducted by slowly walking survey routes. Sites with deep canyons, ridgelines, steep terrain, and thick shrub cover should be surveyed more slowly. Prevailing site conditions and professional judgment must be applied to determine appropriate survey routes and acreage covered per day. These factors may dictate that the maximum daily coverage specified below is not prudent under certain conditions. No more than 100 acres (40ha) shall be surveyed per biologist per day*." (USFWS 1997)

Surveys were conducted in accordance with the 1997 USFWS guidelines for projects located outside of an adopted California Natural Community Conservation Planning (NCCP) (Jurupa Community Services District not a permittee to the Western Riverside County MSHCP), which stipulates that during the breeding season (March 15$^{th}$ to June 30$^{th}$), a minimum of six (6) surveys shall be conducted in all areas of suitable habitat with at least seven (7) days between site visits and surveys conducted between June

30th and March 15th, a minimum of nine (9) surveys shall be conducted with at least fourteen (14) days between site visits. Therefore, six (6) surveys were conducted during the breeding season. Surveys were not conducted during extreme weather conditions (i.e., winds exceeding 15 miles per hour, rain, or temperatures in excess of 95º F). The Survey Area was surveyed on foot by walking slowly and methodically throughout all suitable habitats. Presence of coastal California gnatcatchers was determined by identification of birds by sight and call, using a combination of taped vocalization and "pishing" sounds. The use of taped vocalizations was utilized only when necessary to elicit a response from birds potentially present on site.

Focused surveys were conducted on April 28th, May 8th, 22nd, June 5th, 19th, and 26th, 2019 by permitted coastal California gnatcatcher biologist Ruben Ramirez (USFWS Permit 780566-14, CDFW 002243) (Cadre Environmental 2019).

### Sensitive Plant Surveys

Based on the results of a habitat assessment conducted on April 2nd, 2019, potential habitat is present on the property for sensitive plant species. According, focused surveys are required during the appropriate flowering season to identify and document the presence/absence of target sensitive plant species if suitable habitat is present. Therefore, focused surveys for sensitive plants were conducted during the spring of 2019. Dates of the field surveys include: April 28th, May 8th, 22nd, June 5th, 19th, and 26th, 2019, during which time sensitive plants would have been documented, if present. Each focused survey was conducted on-foot and covered all suitable habitats onsite according to USFWS, California Native Plant Society (CNPS), and CDFW survey guidelines, Figure 2, *Project Site Vicinity Map*).

Prior to conducting focused surveys, a thorough archival review was conducted using the following baseline resources:

- California Native Plant Society 8th Inventory Online (2019);
- California Natural Diversity Data Base for the USGS 7.5' Fontana Quadrangle (CNDDB 2019);
- Soil Survey of Western Riverside Area (Knecht 1971; USDA-NRCS 2019);
- Vegetation Alliances of Western Riverside County, California (Klein and Evens 2005);
- Vascular Flora of Western Riverside County (Roberts et al. 2004); and
- Reports prepared by the Regional Conservation Authority, Western Riverside County (http://www.wrc-rca.org/about-rca/monitoring/monitoring-surveys/);

A site-specific survey program was also developed to achieve the following goals: (1) characterize the vegetation; (2) prepare a detailed floristic plant list; (3) conduct focused surveys to document the distribution and abundance, or absence, of sensitive plant species at the site; and 4) prepare botanical resource maps showing the distribution of vegetation communities and the location of the target species observed onsite. The project surveys also proposed to document other CNPS sensitive plants or species of local concern onsite, if present.

Cadre Environmental conducted the vegetation mapping during the initial habitat assessment as shown in Figure 4, *Vegetation Communities Map*, and Figures 5 and 6, *Current Project Site Photographs*.

## EXISTING ENVIRONMENTAL SETTING

The following section presents the existing conditions of the Project Site assessment area. The Project Site is a 1.07-acre proposed expansion of the existing Jurupa Community Services District's Benedict Reservoir facilities located at 2169 Sandra Drive. Dominant vegetation communities include Riversidean sage scrub with an equal understory of ruderal non-native plant species as described below and presented in Table 1, *Project Site Vegetation Community Acreages*. Several ornamental trees are also located onsite. Substrates onsite are characterized as Cieneba sandy loam (ChD2) and Vista course sandy loam (CsD2) (USDA 2019).

### VEGETATION COMMUNITIES

#### Riversidean Sage Scrub (RSS)

The dominant vegetation community documented within and adjacent to the Project Site was Riversidean sage scrub. Common species documented within this vegetation community include brittlebush (*Encelia farinosa*), California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), desert wishbone bush (*Mirabilis laevis*), California bluebells (*Phacelia minor*), common eucrypta (*Eucrypta chrysanthemifolia*), pygmy weed (*Crassula connata*), slender pectocarya (*Pectocarya linearis*), annual sunflower (*Helianthus annuus*), common fiddleneck (*Amsinckia menziesii*), and blue dicks (*Dichelostemma capitatum*). Non-native species documented within this vegetation community include yellow sweet clover (*Melilotus officinalis*), ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis*), common Mediterranean grass (*Schismus barbatus*), false barley (*Hordeum murinum*), wild oat (*Avena fatua*), red stemmed filaree (*Erodium cicutarium*), black mustard (*Brassica nigra*), London rocket (*Sisymbrium irio*), and common sow thistle (*Sonchus oleraceus*).

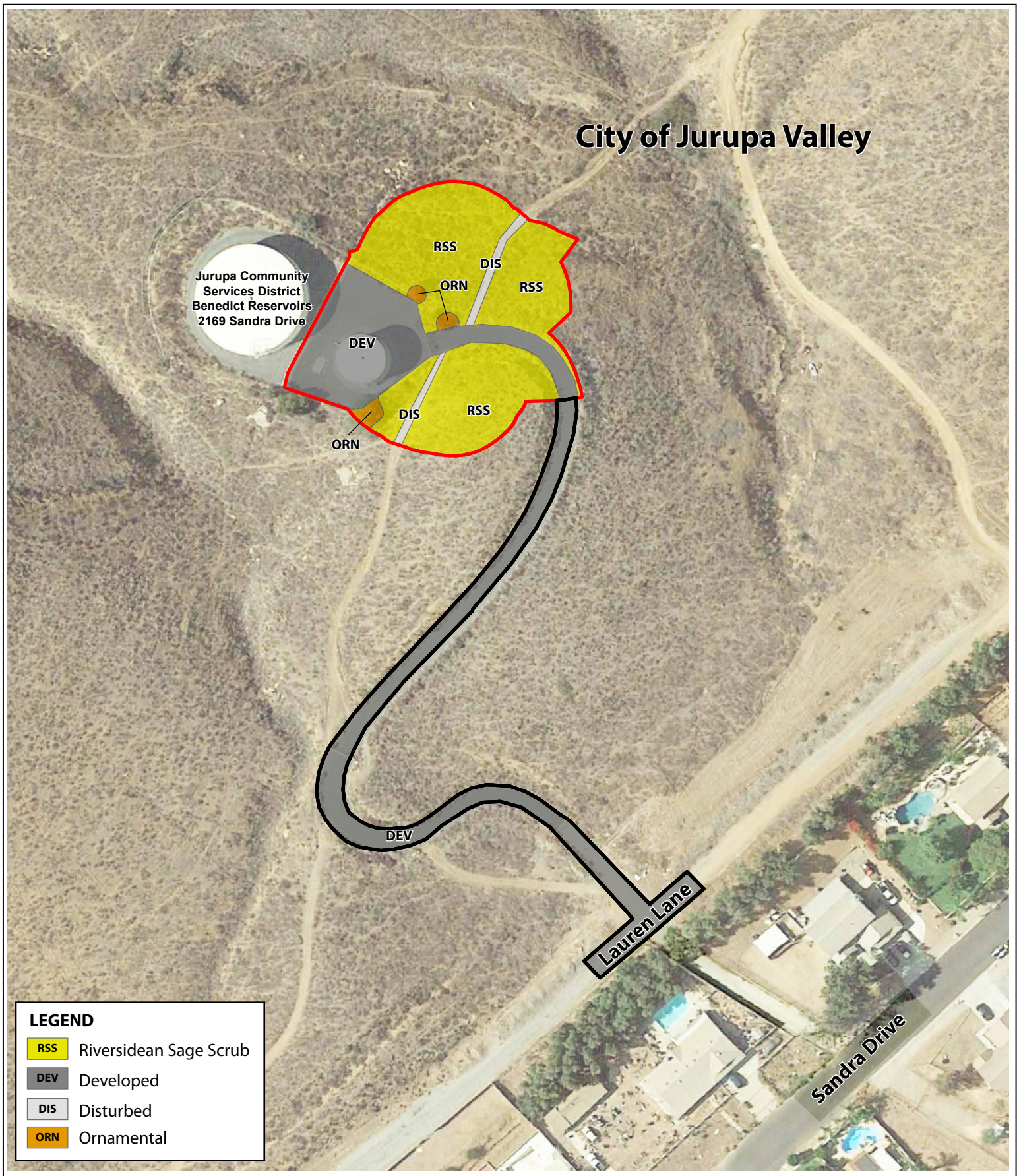
#### Developed (DEV), Disturbed (DIS), Ornamental Trees (ORN)

The Project site included the developed regions of the existing Jurupa Community Services District's Benedict reservoirs and existing access road. Several ornamental plants are located adjacent to the facility including Eucalyptus (*Eucalyptus* sp.) and Peruvian pepper (*Schinus molle*) trees.

**Table 1 – Project Site Vegetation Community Acreages**

| Vegetation Community | Acres |
|---|---|
| Riversidean Sage Scrub | 0.52 |
| Developed (Existing Facility & Access Road) | 0.51 |
| Disturbed | 0.02 |
| Ornamental Trees | 0.02 |
| **TOTAL** | **1.07** |

*Source: Cadre Environmental 2019.*




Portion of APN 174-040-020 | Project Site | Access Route & Staging Area

**Figure 4 - Vegetation Communities Map**

*Biological Resources Technical Report*

*Jurupa Community Services District's Benedict Reservoir Project*

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N

1 inch = 100 ft.

PHOTOGRAPH 1 - Northward view of Project Site and existing reservoirs from disturbed trail bordered by Riversidean sage scrub.

PHOTOGRAPH 2 - Northwest view of Project Site and existing reservoirs.

*Refer to Figure 2 for Photographic Key Map*

**Figure 5 - Current Project Site Photographs**

*Biological Resources Technical Report*
*Jurupa Community Services District's Benedict Reservoir Project*

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PHOTOGRAPH 3 - Southwest view of access road and staging area bordered by Riversidean sage scrub.

PHOTOGRAPH 4 - Southeast view of access road and staging area extending from Lauren Lane and bordered by Riversidean sage scrub.

*Refer to Figure 2 for Photographic Key Map*

**Figure 6 - Current Project Site Photographs**

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## GENERAL PLANT & WILDIFE SPECIES

General plant species documented within the Project Site are presented in the previous section.

General wildlife species documented onsite include but are not limited to turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), Costa's hummingbird (*Calypte costae*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), cliff swallow (*Petrochelidon pyrrhonota*), white-throated swift (*Aeronautes saxatalis*), killdeer (*Charadrius vociferus*), bushtit (*Psaltriparus minimus*), wrentit (*Chamaea fasciata*), California quail (*Callipepla californica*), yellow rumped warbler (*Setophaga coronata*), American crow (*Corvus brachyrhynchos*), western meadowlark (*Sturnella neglecta*), California towhee (*Melozone crissalis*), spotted towhee (*Pipilo maculatus*), California thrasher (*Toxostoma redivivum*), northern mockingbird (*Mimus polyclottos*), European starling (*Sturnus vulgaris*), lesser goldfinch (*Spinus psaltria*), and house finch (*Haemorhous mexicanus*).

## JURISDICTIONAL WETLAND RESOURCES

No wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project Site.

Impacts to water quality would be less than significant during both construction and operation. The project contractor would implement standard BMPs during construction, incorporate landscape features and bio-swales that would provide pervious surface to capture on-site runoff.

# SENSITIVE BIOLOGICAL RESOURCES AND POTENTIAL IMPACTS DISCUSSION

The following discussion describes the plant and wildlife species present, or potentially present within the property boundaries, that have been afforded special recognition by federal, state, or local resource conservation agencies and organizations, principally due to the species' declining or limited population sizes, usually resulting from habitat loss. Also discussed are habitats that are unique, of relatively limited distribution, or of particular value to wildlife. Protected sensitive species are classified by state and/or federal resource management agencies, or both, as threatened or endangered, under provisions of the state and federal endangered species act. Vulnerable or "at-risk" species that are proposed for listing as threatened or endangered (and thereby for protected status) are categorized administratively as "candidates" by the USFWS. CDFW uses various terminology and classifications to describe vulnerable species. There are additional sensitive species classifications applicable in California. These are described below.

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, or rare. The CDFW, USFWS, and special groups like the California Native Plant Society (CNPS) maintain watch lists of such resources. For the

purpose of this assessment sources used to determine the sensitive status of biological resources are:

**Plants**: USFWS (2018), CDFW (2018d, 2018e), CNDDB (2018a), and CNPS (Skinner and Pavlik 1994).

**Wildlife:** California Wildlife Habitat Relationships Database System (CWHRDS 1991), USFWS (2018), CDFW (2018b, 2018c), CNDDB (2018a).

**Habitats**: CNDDB (2018a), CDFW (2018f).

## FEDERAL PROTECTION AND CLASSIFICATIONS

The Federal Endangered Species Act of 1973 (FESA) defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range..." Threatened species are defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under provisions of Section 9(a)(1)(B) of the FESA it is unlawful to "take" any listed species. "Take" is defined as follows in Section 3(18) of the FESA: "...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Further, the USFWS, through regulation, has interpreted the terms "harm" and "harass" to include certain types of habitat modification as forms of a "take." These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a federal agency for an action that could affect a federally listed plant and animal species, the property owner and agency are required to consult with USFWS. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants. Recently, the USFWS instituted changes in the listing status of former candidate species. Former C1 (candidate) species are now referred to simply as candidate species and represent the only candidates for listing. Former C2 species (for which the USFWS had insufficient evidence to warrant listing at this time) and C3 species (either extinct, no longer a valid taxon or more abundant than was formerly believed) are no longer considered as candidate species. Therefore, these species are no longer maintained in list form by the USFWS, nor are they formally protected. However, some USFWS field offices have issued memoranda stating that former C2 species are henceforth to be considered Federal Species of Concern. This term is employed in this document but carries no official protections. All references to federally protected species in this report (whether listed, proposed for listing or candidate) include the most current published status or candidate category to which each species has been assigned by USFWS.

For purposes of this assessment, the following acronyms are used for federal status species:

| | |
|---|---|
| FE | Federal Endangered |
| FT | Federal Threatened |
| FPE | Federal Proposed Endangered |
| FPT | Federal Proposed Threatened |

| | |
|---|---|
| FC | Federal Candidate for Listing |

The designation of critical habitat can also have a significant impact on the development of land designated as "*critical habitat*." The FESA prohibits federal agencies from taking any action that will "*adversely modify or destroy*" critical habitat (16 U.S.C. § 1536(a)(2)). This provision of the FESA applies to the issuance of permits by federal agencies. Before approving an action affecting critical habitat, the federal agency is required to consult with the USFWS who then issues a biological opinion evaluating whether the action will "*adversely modify"* critical habitat. Thus, the designation of critical habitat effectively gives the USFWS extensive regulatory control over the development of land designated as critical habitat.

The Migratory Bird Treaty Act of 1918 (MBTA) makes it unlawful to "*take*" any migratory bird or part, nest, or egg of such bird listed in wildlife protection treaties between the United States and Great Britain, the Republic of Mexico, Japan, and the Union of Soviet States. For purposes of the MBTA, "*take*" is defined as to pursue, hunt, capture, kill, or possess or attempt to do the same.

The Bald Eagle and Golden Eagle Protection Act explicitly protects the bald eagle and golden eagle and imposes its own prohibition on any taking of these species. As defined in this act, take means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb. Current USFWS policy is not to refer the incidental take of bald eagles for prosecution under the Bald Eagle and Golden Eagle Protection Act (16 U.S.C. 668-668d).

## STATE PROTECTION AND CLASSIFICATIONS

California's Endangered Species Act (CESA) defines an endangered species as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." The State defines a threatened species as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as rare on or before January 1, 1985 is a threatened species." Candidate species are defined as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list." Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the Fish and Game Commission. Unlike FESA, CESA does not include listing provisions for invertebrate species.

Article 3, Sections 2080 through 2085, of CESA addresses the taking of threatened or endangered species by stating "No person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or

product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided..." Under CESA, "take" is defined as "...hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Exceptions authorized by the state to allow "take" require "...permits or memorandums of understanding..." and can be authorized for "...endangered species, threatened species, or candidate species for scientific, educational, or management purposes." Sections 1901 and 1913 of the California Fish and Game Code provide that notification is required prior to disturbance.

Additionally, some sensitive mammals and birds are protected by the State as Fully Protected Mammals or Fully Protected Birds, as described in the California Fish and Game Code, Sections 4700 and 3511, respectively. SSC ("special" animals and plants) listings include special status species, including all state and federal protected and candidate taxa, Bureau of Land Management (BLM) and US Forest Service (USFS) sensitive species, species considered to be declining or rare by the CNPS or National Audubon Society, and a selection of species which are considered to be under population stress but are not formally proposed for listing. This list is primarily a working document for the CDFW's CNDDB project. Informally listed taxa are not protected per se, but warrant consideration in the preparation of biotic assessments. For some species, the CNDDB is only concerned with specific portions of the life history, such as roosts, rookeries, or nest sites.

For the purposes of this assessment, the following acronyms are used for State status species:

| | |
|---|---|
| SE | State Endangered |
| ST | State Threatened |
| SCE | State Candidate Endangered |
| SCT | State Candidate Threatened |
| SFP | State Fully Protected |
| SP | State Protected |
| SR | State Rare |
| SSC | California Species of Special Concern |
| CWL | California Watch List |

The CNPS is a private plant conservation organization dedicated to the monitoring and protection of sensitive species in the State. This organization has compiled an inventory comprised of the information focusing on geographic distribution and qualitative characterization of rare, threatened, or endangered vascular plant species of California (Tibor 2001). The list serves as the candidate list for listing as threatened and endangered by CDFW. The CNPS has developed five categories of rarity (CRPR):

| | |
|---|---|
| CRPR 1A | Presumed extinct in California. |
| CRPR 1B | 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 | Plants about which we need more information – a review list. |
| CRPR 4 | Species of limited distribution in California (i.e., naturally rare in the wild), but whose existence does not appear to be susceptible to threat. |

As stated by the CNPS:

> "*Threat Rank is an extension added onto the California Rare Plant Rank and designates the level of endangerment by a 1 to 3 ranking with 1 being the most endangered and 3 being the least endangered. A Threat Rank is present for all California Rare Plant Rank 1B's, 2's, 4's, and the majority of California Rare Plant Rank 3's. California Rare Plant Rank 4 plants are seldom assigned a Threat Rank of 0.1, as they generally have large enough populations to not have significant threats to their continued existence in California; however, certain conditions exist to make the plant a species of concern and hence be assigned a California Rare Plant Rank. In addition, all California Rare Plant Rank 1A (presumed extinct in California), and some California Rare Plant Rank 3 (need more information) plants, which lack threat information, do not have a Threat Rank extension."* (CNPS 2018)

| | |
|---|---|
| 0.1 | Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat) |
| 0.2 | Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat) |
| 0.3 | Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known) |

## LOCAL PROTECTION AND CLASSIFICATIONS

The City of Jurupa Valley's Municipal Code (Chapter 7.55 Street Trees) requires that the Public Works Director be responsible for the enforcement of the street tree planting and removal requirements. As stated by the City of Jurupa Valley:

> "*No person, firm, corporation, public district, public agency or political subdivision shall remove or severely trim any tree planted in the right-of-way of any city highway without first obtaining a permit from the Public Works Director to do so. Such permit shall be issued without fee, if the Public Works Director is satisfied that such removal or trimming is in the public interest or is necessary for the improvement of the right-of-way or the construction of improvements on adjacent land. He or she may impose such conditions as he or she deems reasonable or necessary, including requirements for the work to be done only by a qualified tree surgeon or tree trimmer actually engaged in that business, and for bond, insurance or*

> *other security to protect person and property from injury or damage. The provisions limiting trimming of trees shall not apply to any public utility maintaining overhead power of communication lines pursuant to franchise, where necessary to prevent interference of a tree with such installation. A permit for removal of a tree may be conditioned upon its relocation or replacement by one or more other trees of a kind or type to be specified in the permit."* (City of Jurupa Valley, Section 13.10.050, Tree Removal)

The non-native Eucalyptus and Peruvian pepper trees located within the Project Site are not located within a City right-of-way and do not meet the jurisdictional requirements for protection under the City's Municipal Code (Section 13.10.050,Tree Removal ). No Impact.

**SENSITIVE HABITATS**

As stated by CDFW:

> "*One purpose of the vegetation classification is to assist in determining the level of rarity and imperilment of vegetation types. Ranking of alliances according to their degree of imperilment (as measured by rarity, trends, and threats) follows NatureServe's Heritage Methodology, in which all alliances are listed with a G (global) and S (state) rank. For alliances with State ranks of S1-S3, all associations within them are also considered to be highly imperiled*". (CDFW 2017c)

No sensitive habitats were documented within the Project Site. No Impact.

**SENSITIVE PLANTS**

Based on the results of the initial habitat assessment and review of the western Riverside County MSHCP and CNDDB, a total of ten (10) sensitive plant species have potential of occurring within the vicinity of the Project Site as presented in Table 2, *Sensitive Plant Species Assessment* (CNDDB 2018a, MSHCP 2004).

No state or federally listed threatened, endangered, or MSHCP narrow endemic plants were observed onsite during the focused surveys conducted during the spring of 2019 as listed in Table 2, *Sensitive Plant Species Assessment*. No Impact.

## Table 2. Sensitive Plant Species Assessment

| **Species Name**<br>(*Scientific Name*)<br><br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| | | |
| **San Diego ambrosia**<br>(*Ambrosia pumila*)<br><br>FE<br>CRPR List 1B.1<br>MSHCP Narrow Endemic | San Diego ambrosia is known from Baja California, Mexico, and San Diego and Riverside counties in the United States. It blooms May to September. San Diego ambrosia occurs primarily on upper terraces of rivers and drainages as well as in open grasslands, openings in coastal sage scrub, and occasionally in areas adjacent to vernal pools. | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |
| **Plummer's mariposa-lily**<br>(*Calochortus plummerae*)<br><br>CRPR 4.2 | Perennial bulbiferous herb which generally blooms from May to June within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and grassland habitats with granite and rocky substrates. (CNPS 2019) | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |
| **Parry's spineflower**<br>(*Chorizanthe parryi var. parryi*)<br><br>CRPR 1B.1 | Annual herb, generally blooms from April to June within chaparral, cismontane woodland, coastal scrub, grassland habitats with sandy, rocky openings. (CNPS 2019) | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |
| **Slender-horned spineflower**<br>(*Dodecahema leptoceras*)<br><br>CRPR 1B.1<br>FE/SE | Annual herb which generally blooms from April to June within chaparral, cismontane woodland and coastal scrub (alluvial fan) with sandy substrates. (CNPS 2019) | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |
| **Mesa horkelia**<br>(*Horkelia cuneata ssp. puberula*)<br><br>CRPR 1B.1 | Perennial herb which generally blooms from February to September within chaparral (maritime), cismontane woodland and coastal scrub with sandy or gravelly substrates. (CNPS 2019) | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |

| **Species Name**<br>(*Scientific Name*)<br><br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Parish's desert-thorn**<br>(*Lycium parishii*)<br><br>CRPR 2B.3 | Perennial herb which generally blooms from March to April in coastal scrub and Sonoran Desert scrub habitats. (CNPS 2019) | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |
| **Pringle's monardella**<br>(*Monardella pringlei*)<br><br>CRPR 1A | Annual herb which generally blooms from May to June in coastal scrub dominated sandy substrates. (CNPS 2019) | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |
| **Brand's phacelia**<br>(*Phacelia stellaris*)<br><br>CRPR List 1B.1<br>MSHCP Narrow Endemic | Brand's phacelia is an annual herb. It blooms March to June. This species occurs in coastal sage scrub and dune habitats. | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |
| **San Miquel savory**<br>(*Satureja chandleri*)<br><br>FT/SE<br>CRPR List 1B.2<br>MSHCP Narrow Endemic | San Miquel savory is a perennial shrub that blooms from March to July. This species occurs in rocky habitats within chaparral, coastal scrub, riparian woodland, and grassland habitats. | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |
| **Chaparral ragwort**<br>(*Senecio aphanactis*)<br><br>CRPR 2B.2 | Annual herb which generally blooms from January to May within chaparral, cismontane woodland and coastal scrub habitats. (CNPS 2019) | Not detected within Project Site during focused spring 2019 sensitive plant surveys. |

**California Native Plant Society (CNPS): California Rare Plant Rank (CRPR)**
CRPR 1A – plants presumed extinct in California
CRPR 1B – plants rare, threatened, or endangered in California, but more common 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 – plants about which we need more information, a review list
CRPR 4 – plants of limited distribution, a watch list
.1 – Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

**Federal (USFWS) Protection and Classification**
FE – Federally Endangered
FT – Federally Threatened
FC – Federal Candidate for Listing

**State (CDFW) Protection and Classification**
SE – State Endangered
ST – State Threatened

## SENSITIVE WILDLIFE

Based on the results of the initial habitat assessment, focused surveys for coastal California gnatcatcher, and review of the western Riverside County MSHCP and CNDDB, a total of nineteen (19) sensitive wildlife species have the potential of occurring within the region of the Project Site as presented in Table 3, *Sensitive Wildlife Species Assessment* (CNDDB 2018a, MSHCP 2004). No state or federally listed threatened, endangered, or MSHCP target species were observed onsite during the habitat assessment or focused surveys conducted during the spring of 2019 as listed in Table 3, *Sensitive Wildlife Species Assessment*.

There exists a moderate potential for eight (8) sensitive wildlife species to occur onsite within the Riversidean sage scrub. Impacts to 0.52-acre of Riversidean sage scrub would represent a less than significant impact.

**Table 3. Sensitive Wildlife Species Assessment**

| **Species Name**<br>(*Scientific Name*)<br><br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **INVERTEBRATES** | | |
| **Delhi Sands flower-loving fly**<br>(*Rhaphiomidas terminatus abdominalis*)<br><br>FE | Restricted to Delhi sand formations in Riverside and San Bernardino Counties. | Not expected to occur onsite based on a lack of suitable soils. |
| **REPTILES** | | |
| **Orange-throated whiptail**<br>(*Aspidoscelis hyperythra*)<br><br>WL | The orange-throated whiptail occurs in Riversidean sage scrub and chaparral where loose soils and occasional rocky areas are found. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation. |
| **Coast horned lizard**<br>(*Phrynosoma blainvillii*)<br><br>SSC | The horned lizard occurs primarily in scrub, chaparral, and grassland habitats. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation. |
| **BIRDS** | | |
| **Bell's sage sparrow**<br>(*Artemisiospiza belli belli*)<br><br>CWL | This species is typically found in chaparral on alluvial fans and foothills. | Not observed or expected to occur onsite based on a lack of suitable habitat. |
| **Cooper's hawk**<br>(*Accipiter cooperii*)<br><br>SSC | Cooper's hawk is most commonly found within or adjacent to riparian/oak forest and woodland habitats. This uncommon resident of California increases in numbers during winter migration. | Cooper's hawks occasionally nest in large pines and Eucalyptus trees. No nests were documented onsite and the majority of ornamental trees are small in stature and not expected to be utilized for nesting. |

| **Species Name**<br>(*Scientific Name*)<br><br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Southern California rufous-crowned sparrow**<br>(*Aimophila ruficeps canescens*)<br><br>CWL | Southern California rufous-crowned sparrow is a non-migratory bird species that primarily occurs within sage scrub and grassland habitats and to a lesser extent chaparral sub-association. This species generally breeds on the ground within grassland and scrub communities in the western and central regions of California. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation. |
| **Golden eagle**<br>(*Aquila chrysaetos*)<br><br>CWL, SFP | Within southern California, the species prefers grasslands, brushlands (coastal sage scrub and chaparral), deserts, oak savannas, open coniferous forests, and montane valleys. | Not expected to occur onsite based on a lack of suitable habitat. |
| **Burrowing owl**<br>(*Athene cunicularia)*<br><br>SSC | The burrowing owl uses predominantly open land, including grassland, agriculture (e.g., dry-land farming and grazing areas), playa, and sparse coastal sage scrub and desert scrub habitats. Some breeding burrowing owls are year-round residents and additional individuals from the north may winter throughout the region. | Not expected to occur onsite. No suitable burrows documented within the Project Site. |
| **Northern Harrier**<br>(*Circus cyaneus*)<br><br>SSC | The northern harrier frequents open wetlands, wet/lightly grazed pastures, fields, dry uplands/prairies, mesic grasslands, drained marshlands, croplands, meadows, grasslands, open rangelands, fresh and saltwater emergent wetlands. | Not observed or expected to occur onsite based on a lack of suitable habitat. |

| **Species Name**<br>(*Scientific Name*)<br><br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Least Bell's vireo**<br>*(Vireo bellii pusillus)*<br><br>FE, SE | Least Bell's vireo resides in riparian habitats with a well-defined understory including southern willow scrub, mule fat, and riparian forest/woodland habitats. | Not expected to occur onsite based on a lack of riparian within or adjacent to the Project Site. |
| **Southwestern willow flycatcher**<br>*(Empidonax traillii extimus)*<br><br>FE, SE | The southwestern willow flycatcher is narrowly distributed. Although the preferred habitat, riparian woodland and select other forests, is well distributed within all, few current locations for the willow flycatcher have been documented. | Not expected to occur onsite based on a lack of riparian within or adjacent to the Project Site. |
| **Loggerhead shrike**<br>(*Lanius ludovicianus*)<br><br>SSC | This species of shrike hunts in open or grassy areas and nests in large chaparral shrubs such as ceanothus and lemonade berry. | Not expected to occur onsite based on a lack of suitable habitat |
| **Coastal California gnatcatcher**<br>(*Polioptila californica californica*)<br><br>FT/SSC | The coastal California gnatcatcher is a non-migratory bird species that primarily occurs within sage scrub habitats in coastal southern California dominated by California sagebrush. | No federally threatened coastal California gnatcatchers documented within the Survey Area during six (6) USFWS focused surveys (Cadre Environmental 2019). The species may occur onsite in the future based on the presence of suitable habitat and observations north of the property in the Jurupa Mountains (USFWS 2019, 1995 observations). |
| **MAMMALS** | | |
| **Northwestern San Diego pocket mouse**<br>(*Chaetodipus fallax fallax*)<br><br>SSC | The northwestern San Diego pocket mouse occurs in coastal sage, upland sage scrubs, and alluvial fan sage scrub, sage scrub/grassland ecotones, chaparral, and desert scrubs at all elevations up to 6,000 feet. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation. |

| **Species Name**<br>(*Scientific Name*)<br><br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **San Bernardino kangaroo rat**<br>(*Dipodomys merriami parvus*)<br><br>FE/SSC | Prefers alluvial scrub, coastal sage scrub habitats with sandy and gravelly substrates. | Not expected to occur onsite based on a lack of alluvial fan or adjacent terrace habitats. |
| **Western mastiff bat**<br>(*Eumops perotis californicus*)<br><br>SSC | Roosts in rocky areas and forages in grassland, shrublands, and woodlands. | Not expected to occur onsite based on a lack of suitable habitat. |
| **Western yellow bat**<br>(*Lasiurus xanthinus*)<br><br>SSC | Roosts in the skirts of palm trees and forages in adjacent habitats. | Not expected to occur onsite based on a lack of suitable foraging habitat within the vicinity of the Project Site. |
| **San Diego black-tailed jackrabbit**<br>(*Lepus californicus bennettii*)<br><br>SSC | The San Diego black-tailed jackrabbit in open habitats, primarily including grasslands, sage scrub, alluvial fan sage scrub, and Great Basin sage scrub. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation |
| **Los Angeles pocket mouse**<br>(*Perognathus longimembris brevinasus*)<br><br>SSC | Low elevation grassland alluvial sage scrub and coastal sage scrub habitats. | Moderate potential to occur onsite within the Riversidean sage scrub vegetation |

**Federal (USFWS) Protection and Classification**
FE – Federally Endangered
FT – Federally Threatened
FC – Federal Candidate for Listing

**State (CDFW) Protection and Classification**
SE – State Endangered
SPE – State Proposed Endangered
ST – State Threatened
SSC – State Species of Special Concern
CWL – California Watch List
SPF – State Fully Protected

The Project Site is located completely within USFWS critical habitat for the coastal California gnatcatcher (Western Riverside County MSHCP Excluded Essential Habitat). As stated by the USFWS:

> "*Critical habitat designations affect only Federal agency actions or federally funded or permitted activities. Critical habitat designations do not affect activities by private landowners if there is no Federal "nexus"—that is, no Federal funding or authorization. Federal agencies are required to avoid "destruction" or "adverse modification" of designated critical habitat.*

> *The ESA requires the designation of "critical habitat" for listed species when "prudent and determinable*." (USFWS 2017)

The proposed project does not require a federal action and is not federally funded. No impact.

## JURISDICTIONAL WETLAND RESOURCES

No wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project Site.

Impacts to water quality would be less than significant during both construction and operation. The project contractor would implement standard BMPs during construction, incorporate landscape features and bio-swales that would provide pervious surface to capture on-site runoff.

# WESTERN RIVERSIDE COUNTY MULTIPLE SPECIES HABITAT CONSERVATION PLAN COMPLIANCE ANALYSIS

Although the Jurupa Community Services District is not a permittee to the western Riverside County MSHCP, the following section summarizes the Project Site's relationship to MSHCP criteria areas and MSHCP compliance guidelines.

## CRITERIA AREAS

The 1.07-acre Project Site is located within the Western Riverside County MSHCP Jurupa Area Plan. The Project Site is located within the northeast region of Criteria Cell 8, and Cell Group G. As stated by the MSHCP:

> "*Conservation within this Cell Group will contribute to assembly of Proposed Noncontiguous Habitat Block 2. Conservation within this Cell Group will focus on coastal sage scrub habitat. Areas conserved within this Cell Group will be connected to coastal sage scrub habitat proposed for conservation in Cell Group F to the west. Conservation within this Cell Group will range from 10%-20% of the Cell Group focusing in the northwestern portion of the Cell Group. See also species-specific conservation objectives 1A, 1B and 1C for Delhi Sands flower-loving fly in Table 9-2 of this document for Criteria for this Cell Group*." (MSHCP 2004)

The Project Site is not located within or adjacent to a linkage area or Proposed Noncontiguous Habitat Block 2. Also, the Project Site is located in the extreme northeast region of Cell Group G where no conservation is identified for contribution to MSHCP reserve design.

The proposed action (direct impacts to 0.52 acre of Riversidean sage scrub) would not conflict with the MSHCP reserve design and conservation goals for Criteria Cell 8, Cell Group G or Proposed Noncontiguous Habitat Block 2.

## CRITERIA AREA SPECIES SURVEY AREA

The Project Site is not within the Criteria Area Sensitive Plant Survey Area; therefore, no surveys are required (RCA GIS Data Downloads 2019).

The project is consistent with MSHCP Section 6.3.2.

## NARROW ENDEMIC PLANT SPECIES SURVEY AREA

The Project Site occurs within a predetermined Survey Area for three (3) MSHCP narrow endemic plant species including San Diego ambrosia, Brand's phacelia, and San Miguel savory (RCA GIS Data Downloads 2019). Focused sensitive plant surveys were conducted during the spring of 2019 (Cadre Environmental 2019). No MSHCP narrow endemic plants were documented within the Project Site.

The project is consistent with MSHCP Section 6.3.2.

## AMPHIBIAN SPECIES SURVEY AREA

The Project Site is not within the Amphibian Species Survey Area; therefore, no surveys are required (RCA GIS Data Downloads 2019).

The project is consistent with MSHCP Section 6.3.2.

## MAMMAL SPECIES SURVEY AREA

The Project Site is not within the Mammal Species Survey Area; therefore, no surveys are required (RCA GIS Data Downloads 2019).

The project is consistent with MSHCP Section 6.3.2.

## BURROWING OWL SURVEY AREA

The Project Site occurs completely within a predetermined Survey Area for the burrowing owl as shown in Figure 3, *MSHCP Relationship Map*. No suitable burrowing owl burrows potentially utilized for refugia and/or nesting were documented within or adjacent to the Project Site. No owls were detected onsite during six (6) protocol coastal California gnatcatcher surveys during which time, if present, individuals would have been detected.

Implementation of the MBTA nesting bird survey will meet the 30-day burrowing owl preconstruction survey requirement as presented in the following section – Standard Compliance.

The project is consistent with MSHCP Section 6.3.2.

## MSHCP RIPARIAN/RIVERINE AREAS AND VERNAL POOLS

No riparian, riverine or vernal pool resources were documented within or adjacent to the Project Site. No MSHCP Section 6.1.2 resources will be directly or indirectly impacted.

The project will is consistent with MSHCP Section 6.1.2.

## URBAN/WILDLANDS INTERFACE

The MSHCP Urban/Wildlands Interface guidelines presented in Section 6.1.4 are intended to address indirect effects associated with locating commercial, mixed uses and residential developments in proximity to a MSHCP Conservation Area. The Project Site is not located adjacent to an existing or proposed MSHCP Conservation Area.

The project is consistent with MSHCP Section 6.1.4.

## FUELS MANAGEMENT

The fuels management guidelines presented in Section 6.4 of the MSHCP are intended to address brush management activities around new development within or adjacent to MSHCP Conservation Areas. The Project Site is not located adjacent to an existing or proposed MSHCP Conservation Area.

The project is consistent with MSHCP Section 6.4.

Initiation and approval of the proposed project would not conflict with any MSHCP conservation goals or requirements. The project as proposed based on implementation of an MBTA nesting bird survey as described below is compliant with the western Riverside County MSHCP.

# STANDARD FEDERAL COMPLIANCE

The following standard federal compliance (Migratory Bird Treaty Act [MBTA]) outlined below will ensure any potential impacts related to migratory birds including burrowing owl are less than significant.

## Federal Migratory Bird Treaty Act

Potential direct/indirect impacts to common nesting bird species will require compliance with the federal MBTA. Construction outside the nesting season (between September 1st and February 15th) does not require pre-removal nesting bird surveys. If construction is proposed between February 16th and August 31st, a qualified biologist must conduct a nesting bird survey(s) no more than 14 days prior to initiation of grading to document the presence or absence of nesting birds within or directly adjacent (100 feet) to the Project Site.

The preconstruction survey(s) will focus on identifying any bird nests that may be directly or indirectly affected by construction activities. If active nests are documented,

species-specific measures shall be prepared by a qualified biologist and implemented to prevent abandonment of the active nest.

At a minimum, grading in the vicinity of a nest shall be postponed until the young birds have fledged. A minimum exclusion buffer of 100 feet shall be maintained during construction, depending on the species and location. The perimeter of the nest setback zone shall be fenced or adequately demarcated with stakes and flagging at 20-foot intervals, and construction personnel and activities restricted from the area.

A survey report by a qualified biologist verifying that no active nests are present, or that the young have fledged, shall be submitted to Jurupa Community Services District prior to initiation of grading in the nest-setback zone. The qualified biologist shall serve as a biological monitor during those periods when construction activities occur near active nest areas to ensure that no inadvertent impacts on these nests occur. A final report of the findings, prepared by a qualified biologist, shall be submitted to Jurupa Community Services District prior to construction-related activities that have the potential to disturb any active nests during the nesting season.

Any nest permanently vacated for the season would not warrant protection pursuant to the MBTA.

Compliance with the required MBTA will ensure impacts related to migratory birds are less than significant.

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Certification "*I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge".*

Author:_____ Date: July 18th, 2019

Contact: Ruben S. Ramirez, Jr. 949-300-0212, r.ramirez@cadreenvironmental.com

# Appendix B.2

## INFORMATION SUMMARY

A. Report Date: July 16th, 2019

B. Report Title: Coastal California Gnatcatcher United States Fish and Wildlife Service Focused Surveys for the 1.07-Acre Jurupa Community Services District's Benedict Reservoir Project, City of Jurupa Valley, California.

C. Project Location: Portion of Assessor Parcel Number 174-040-020, extending north of Lauren Lane (access road) within and adjacent to existing reservoirs.

D. Project Contact: Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506
Contact: Cheryl DeGano (951) 320-6052

E. Project Biologist: Cadre Environmental
701 Palomar Airport Road, Suite 300
Carlsbad, CA. 92011
Contact: Ruben S. Ramirez, Jr. (949) 300-0212
USFWS permit #TE780566-14, CDFW permit #02243

F. Date of Surveys: April 28th, May 8th, 22nd, June 5th, 19th, and 26th, 2019.

G. Summary: The 1.07-acre Jurupa Community Services District's Benedict Reservoir Project is dominated by Riversidean sage scrub, ornamental, and developed/disturbed vegetation communities.

Based on the results of the biological resources constraints analysis conducted on April 2nd, 2019, documented presence of suitable habitat for the federally threatened coastal California gnatcatcher (*Polioptila californica californica*), and designation of United States Fish and Wildlife Service (USFWS) critical habitat (Western Riverside County MSHCP Excluded Essential Habitat) throughout the property and adjacent habitats, focused surveys were initiated during the breeding season of 2019. Therefore, as described in the following report, all suitable coastal California gnatcatcher habitat (0.52-acres onsite) including adjacent habitats within 100 feet of the project site (5-acres total) was surveyed to determine the current status of the species.

No coastal California gnatcatcher were documented within or adjacent to the project site during six (6) USFWS focused surveys.

## SUBJECT

**Focused United States Fish and Wildlife Service Coastal California Gnatcatcher Surveys for the 1.07 Acre Jurupa Community Services District's Benedict Reservoir Project Site, City of Jurupa Valley, California.**

This report presents the findings of focused United States Fish and Wildlife Service (USFWS) coastal California gnatcatcher (*Polioptila californica californica)* surveys conducted for the 1.07-acre Jurupa Community Services District's Benedict Reservoir project site (Portion of Assessor Parcel Number 174-040-020) located in the City of Jurupa Valley, California ("Project Site") as illustrated in Attachment A, *Regional Location Map*. Specifically, the Project Site extends north of Lauren Lane along an existing access route and includes the existing reservoir site and adjacent undeveloped lands as illustrated in Attachment B, *Vegetation Communities Map*.

This report incorporates the findings of a habitat assessment, literature review, compilation of existing documentation, and focused USFWS coastal California gnatcatcher surveys conducted on April 28th, May 8th, 22nd, June 5th, 19th, and 26th, 2019.

## METHODS OF STUDY

### APPROACH

Prior to initiating the focused surveys, a biological resources constraints analysis was conducted by Cadre Environmental to determine the presence and/or absence of suitable habitat for sensitive floral and faunal species to occur within and adjacent to the Project Site. The constraints analysis included a review of all available and relevant data on the biological characteristics, sensitive habitats, and species potentially present on or adjacent to the Project Site. Additionally, aerial photography, topographic map data, and USFWS species occurrence database were examined. After conducting an independent habitat assessment on April 2nd. 2019 Cadre Environmental initiated focused surveys for the coastal California gnatcatcher during the spring of 2019.

#### General/Sensitive Wildlife Inventory

All general and sensitive wildlife identified during the focused coastal California gnatcatcher surveys by sight, call, tracks, scat, or other characteristic sign were recorded. In addition to species actually detected, expected use of the site by other wildlife was derived from the analysis of habitats on the site, combined with known habitat preferences of regionally occurring wildlife species.

### Focused Coastal California Gnatcatcher Surveys

Protocol surveys for the federally threatened/state species of special concern, coastal California gnatcatcher were performed in all areas of suitable habitat within and adjacent to the Project Site (100 ft buffer) "Survey Area". A total of approximately 5 acres of suitable habitat (Riversidean sage scrub) were surveyed. As stated by the USFWS:

> "S*urveys shall be conducted between 6:00am and 12:00pm. Surveys shall avoid periods of excessive or abnormal heat, wind, rain, or other inclement weather. Taped coastal California gnatcatcher vocalization shall be used only until*

> *individuals have been initially located. Tapes shall not be used frequently or to illicit further behaviors from the birds. Surveys shall be conducted by slowly walking survey routes. Sites with deep canyons, ridgelines, steep terrain, and thick shrub cover should be surveyed more slowly. Prevailing site conditions and professional judgment must be applied to determine appropriate survey routes and acreage covered per day. These factors may dictate that the maximum daily coverage specified below is not prudent under certain conditions. No more than 100 acres (40ha) shall be surveyed per biologist per day*." (USFWS 1997)

Surveys were conducted in accordance with the 1997 USFWS guidelines for projects located outside of an adopted California Natural Community Conservation Planning (NCCP) (Jurupa Community Services District not a participant in the Western Riverside County MSHCP) , which stipulates that during the breeding season (March 15th to June 30th), a minimum of six (6) surveys shall be conducted in all areas of suitable habitat with at least seven (7) days between site visits and surveys conducted between June 30th and March 15th, a minimum of nine (9) surveys shall be conducted with at least fourteen (14) days between site visits. Therefore, six (6) surveys were conducted during the breeding season. Surveys were not conducted during extreme weather conditions (i.e., winds exceeding 15 miles per hour, rain, or temperatures in excess of 95º F). The Survey Area was surveyed on foot by walking slowly and methodically throughout all suitable habitats. Presence of coastal California gnatcatchers was determined by identification of birds by sight and call, using a combination of taped vocalization and "pishing" sounds. The use of taped vocalizations was utilized only when necessary to elicit a response from birds potentially present on site.

Focused surveys were conducted on April 28th, May 8th, 22nd, June 5th, 19th, and 26th, 2019 by permitted coastal California gnatcatcher biologist Ruben Ramirez (USFWS Permit 780566-14, CDFW 002243), as outlined in Table 1, *Coastal California Gnatcatcher Survey Schedule*.

**Table 1 – Coastal California Gnatcatcher Survey Schedule**

| Survey | Dates (Conditions) 2019 | Results |
|---|---|---|
| 1 | April 28th - 65°F, winds 4-10 mph, no rain | None |
| 2 | May 8th - 60°F, winds 0-4 mph, no rain | None |
| 3 | May 22nd - 62°F, winds 2-10 mph, no rain, | None |
| 4 | June 5th - 66°F, winds 0 mph, no rain | None |
| 5 | June 19th - 70°F, winds 0-4 mph, no rain | None |
| 6 | June 26th - 72°F, winds 2-8 mph, no rain | None |

## EXISTING CONDITIONS

### VEGETATION COMMUNITIES

The 5 acre Survey Area is dominated by Riversidean sage scrub as described in this report and illustrated in Attachment B, *Vegetation Communities Map*, Attachments C and D, *Current Project Site Photographs*. Natural community names and hierarchical structure follows the "*Manual of California Vegetation*" (Sayer and Keeler-Wolf 2009) classification system, which has been refined and augmented where appropriate to better characterize the habitat types observed.

**Riversidean Sage Scrub (RSS)**

The dominant vegetation community documented within and adjacent to the Project Site was Riversidean sage scrub. Common species documented within this vegetation community include brittlebush (*Encelia farinosa*), California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), desert wishbone bush (*Mirabilis laevis*), California bluebells (*Phacelia minor*), common eucrypta (*Eucrypta chrysanthemifolia*), pygmy weed (*Crassula connata*), slender pectocarya (*Pectocarya linearis*), annual sunflower (*Helianthus annuus*), common fiddleneck (*Amsinckia menziesii*), and blue dicks (*Dichelostemma capitatum*). Non native species documented within this vegetation community include yellow sweet clover (*Melilotus officinalis*), ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis*), common Mediterranean grass (*Schismus barbatus*), false barley (*Hordeum murinum*), wild oat (*Avena fatua*), red stemmed filaree (*Erodium cicutarium*), black mustard (*Brassica nigra*), London rocket (*Sisymbrium irio*), and common sow thistle (*Sonchus oleraceus*).

**Developed (DEV), Disturbed (DIS), Ornamental (ORN)**

The Survey Area included the developed regions of the existing Jurupa Community Services District's Benedict reservoirs and existing access road. Several ornamental plants are located adjacent to the facility including Eucalyptus (*Eucalyptus* sp.) and Peruvian pepper (*Schinus molle*) trees.

The Survey Area is located completely within USFWS critical habitat for the coastal California gnatcatcher (Western Riverside County MSHCP Excluded Essential Habitat) as shown in Attachment E, *Coastal California Gnatcatcher Critical Habitat Map*.

## RESULTS

No federally threatened coastal California gnatcatcher were documented within the Survey Area during six (6) USFWS focused surveys.

General wildlife species documented onsite include but are not limited to turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), Costa's hummingbird (*Calypte costae*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), cliff swallow (*Petrochelidon pyrrhonota*), white-throated swift (*Aeronautes saxatalis*), killdeer (*Charadrius vociferus*), bushtit (*Psaltriparus minimus*), wrentit (*Chamaea fasciata*), California quail (*Callipepla californica*), yellow rumped warbler (*Setophaga coronata*), American crow (*Corvus brachyrhynchos*), western meadowlark (*Sturnella neglecta*), California towhee (*Melozone crissalis*), spotted towhee (*Pipilo maculatus*), California thrasher (*Toxostoma redivivum*), northern mockingbird (*Mimus polyclottos*), European starling (*Sturnus vulgaris*), lesser goldfinch (*Spinus psaltria*), and house finch (*Haemorhous mexicanus*).

## REFERENCES

California Department of Fish and Wildlife (CDFW), Natural Diversity Data Base (CNDDB). 2019. Sensitive Element Record Search for the Fontana Quadrangle. California Department of Fish and Wildlife. Sacramento, California. Accessed July 2019.

U.S. Department of the Interior, Fish and Wildlife Service. 2019. Species Occurrence Database. Accessed July 2019.

U.S. Department of the Interior, Fish and Wildlife Service. December 19, 2007. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*), Final Rule. Federal Register 72 (No. 243):72010-72213.

U.S. Department of the Interior, Fish and Wildlife Service. 1997. Coastal California Gnatcatcher (*Polioptila californica californica*) Presence/Absence Survey Guidelines.

**Attachments**

A – Regional Location Map
B – Vegetation Communities Map
C – Current Project Site Photographs
D – Current Project Site Photographs
E – Coastal California Gnatcatcher Critical Habitat Map

**Certification**

"*I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief*."

Author: _____ Date: July 16th, 2019

Fieldwork Performed By: _____ Date: July 16th, 2019

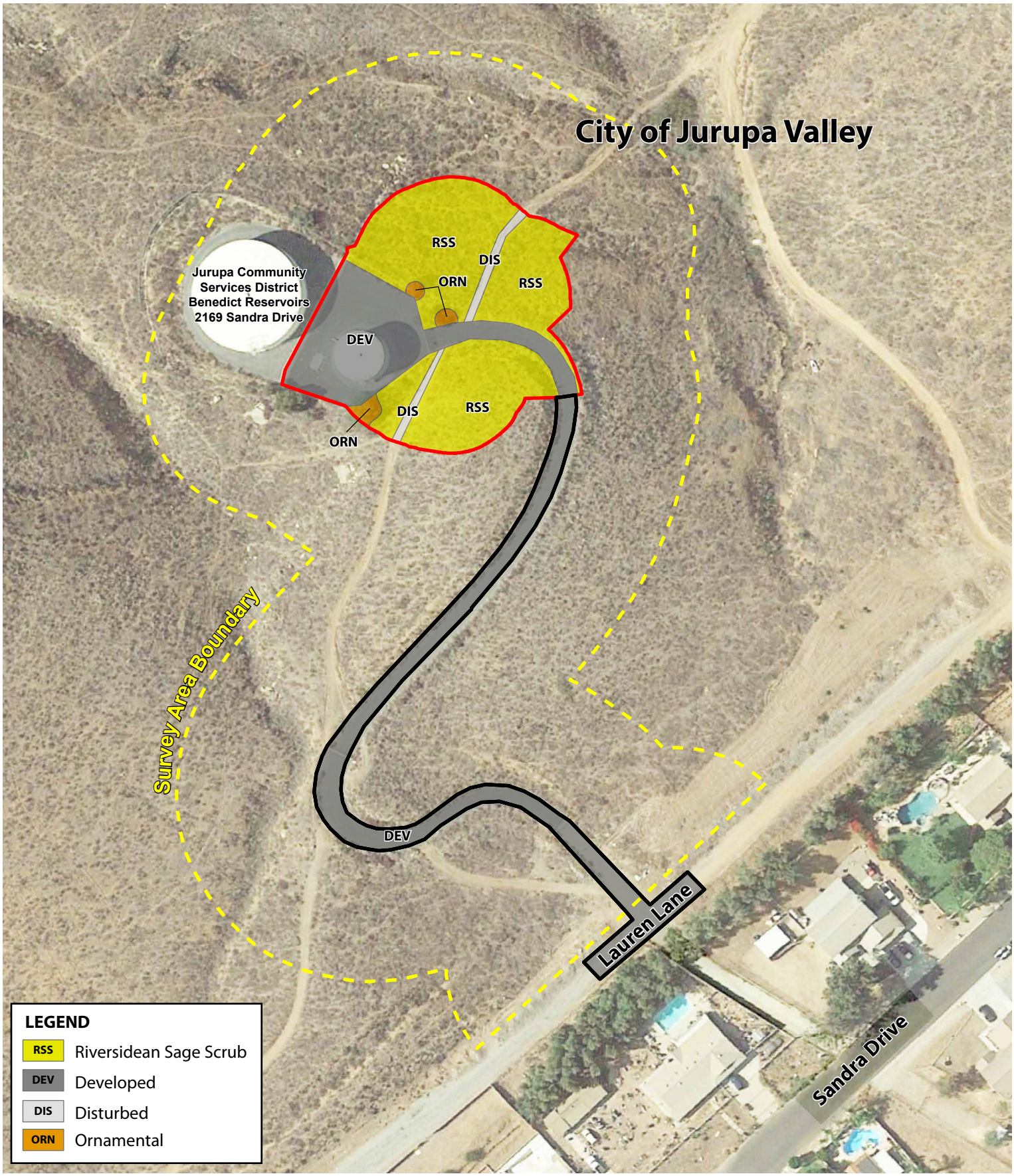

Portion of APN 174-040-020

## Att A - Regional Location Map

*Coastal California Gnatcatcher Focused Surveys*
*Jurupa Community Services District's Benedict Reservoir Project*

CADRE Environmental

N
not to scale




Portion of APN 174-040-020 | Project Site | Access Route & Staging Area

**Att B - Vegetation Communities Map**

*Coastal California Gnatcatcher Focused Surveys*
*Jurupa Community Services District's Benedict Reservoir Project*

CADRE Environmental

N

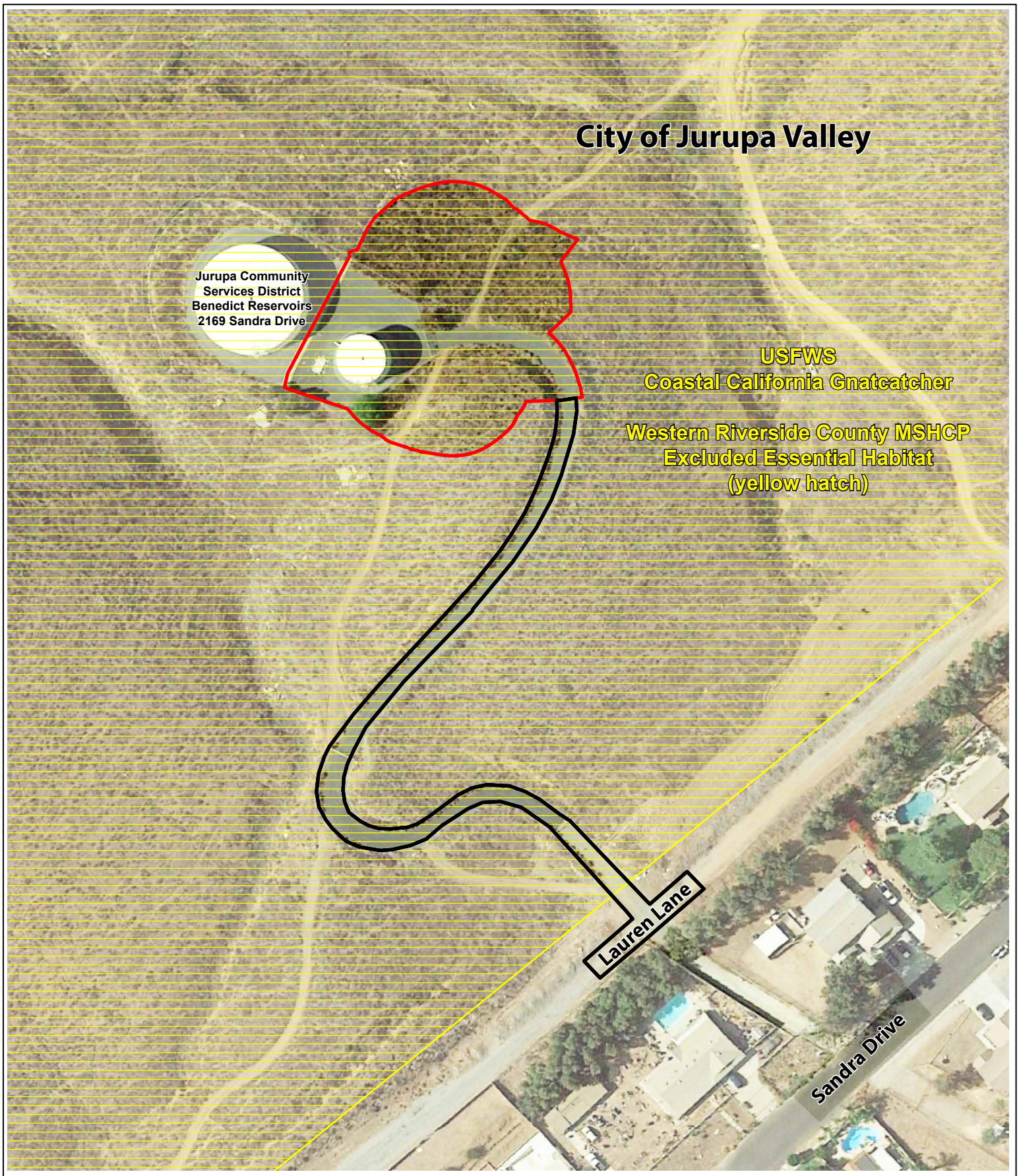
1 inch = 100 ft.

PHOTOGRAPH 1 - Northward view of Project Site and existing reservoirs from disturbed trail bordered by Riversidean sage scrub.

PHOTOGRAPH 2 - Northwest view of Project Site and existing reservoirs.

PHOTOGRAPH 3 - Southwest view of access road and staging area bordered by Riversidean sage scrub.

PHOTOGRAPH 4 - Southeast view of access road and staging area extending from Lauren Lane and bordered by Riversidean sage scrub.




Portion of APN 174-040-020 | Project Site | Access Route & Staging Area

**Att E - USFWS Designated Critical Habitat Map**

*Coastal California Gnatcatcher Focused Surveys*
*Jurupa Community Services District's Benedict Reservoir Project*

CADRE Environmental

N

1 inch = 100 ft.

# Appendix C

**HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT**

# JURUPA COMMUNITY SERVICES DISTRICT
# 0.21-MG BENEDICT RESERVOIR REPLACEMENT PROJECT

**City of Jurupa Valley**
**Riverside County, California**

**For Submittal to:**

Jurupa Community Services District
11201 Harrel Street
Jurupa Valley, CA 91752

**Prepared for:**

Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

**Prepared by:**

CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, CA 92324

Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

February 28, 2019
CRM TECH Contract No. 3423

**Title:** Historical/Archaeological Resources Survey Report: Jurupa Community Services District 0.21-MG Benedict Reservoir Replacement Project, City of Jurupa Valley, Riverside County, California

**Author(s):** Bai "Tom" Tang, Principal Investigator
Terri Jacquemain, Historian/Report Writer
Salvadore Boites, Archaeologist
Nina Gallardo, Archaeologist/Native American Liaison

**Consulting Firm:** CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, CA 92324
(909) 824-6400

**Date:** February 28, 2019

**Prepared for:** Cheryl DeGano
Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506
(951) 686-1070

**For Submittal to:** Jurupa Community Services District
11201 Harrel Street
Jurupa Valley, CA 91752
(951) 685-7434

**USGS Quadrangle:** Fontana, Calif., 7.5' quadrangle (Section 5, T2S R5W, San Bernardino Baseline and Meridian)

**Project Size:** Approximately 1.5 acres

**Keywords:** Jurupa Mountains area, northwestern Riverside County; Phase I cultural resources survey; portion of Assessor's Parcel Number 174-040-0201; 0.21-million-gallon water reservoir/tank, circa 1977, and 1.0-million-gallon water reservoir/tank, circa 1990; not "historical resources" under CEQA

## MANAGEMENT SUMMARY

Between December 2018 and February 2019, at the request of Albert A. Webb Associates, Inc., CRM TECH performed a cultural resources study for a reservoir replacement project in the northeastern portion of the City of Jurupa Valley, Riverside County, California. The subject property consists of an approximately 1.5-acre portion of Assessor's Parcel Number 174-040-020, located on a slope of the Jurupa Mountains and to the north of Lauren Lane, in the southeast quarter of Section 5, T2S R5W, San Bernardino Baseline and Meridian.

As proposed, the project entails primarily the removal and replacement of an existing 0.21-million-gallon (MG) reservoir with a 1.1-MG reservoir, along with associated improvements such as perimeter paving. The study is part of the environmental review process for the project. The Jurupa Community Services District (JCSD), as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA).

The purpose of the study is to provide JCSD with the necessary information and analysis to determine whether the proposed project would cause a substantial adverse change to any "historical resources," as defined by CEQA, that may exist in or around the project area. In order to identify such resources, CRM TECH conducted a historical/archaeological resources records search, pursued historical background research, contacted the State of California Native American Heritage Commission, and carried out a systematic field survey.

The results of these procedures indicate that the existing 0.21-MG reservoir in the project area and an adjacent 1.0-MG reservoir date to 1977 and circa 1990, respectively, and do not meet the age threshold to be considered historical in origin (i.e., more than 50 years of age). As common infrastructure features of standard design and construction, these simple steel tanks are utilitarian in character and demonstrate no remarkable architectural, engineering, artistic, or aesthetic qualities. Without any potential to qualify as "historical resources," they require no further consideration under CEQA provisions on cultural resources.

In summary, no potential "historical resources" were encountered within or adjacent to the project area throughout the course of this study. Therefore, CRM TECH recommends to JCSD a finding of *No Impact* on "historical resources." No further cultural resources investigation is recommended for the project unless construction plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are encountered during any earth-moving operations associated with the project, all work within 50 feet of the discovery should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

## TABLE OF CONTENTS



## LIST OF FIGURES

## INTRODUCTION

Between December 2018 and February 2019, at the request of Albert A. Webb Associates, Inc., CRM TECH performed a cultural resources study for a reservoir replacement project in the northeastern portion of the City of Jurupa Valley, Riverside County, California (Fig. 1). The subject property consists of an approximately 1.5-acre portion of Assessor's Parcel Number 174-040-020, located on a slope of the Jurupa Mountains and to the north of Lauren Lane, in the southeast quarter of Section 5, T2S R5W, San Bernardino Baseline and Meridian (Figs. 2, 3).

As proposed, the project entails primarily the removal and replacement of an existing 0.21-million-gallon (MG) reservoir with a 1.1-MG reservoir, along with associated improvements such as perimeter paving. The study is part of the environmental review process for the project. The Jurupa Community Services District (JCSD), as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.).

The purpose of the study is to provide JCSD with the necessary information and analysis to determine whether the proposed project would cause a substantial adverse change to any "historical resources," as defined by CEQA, that may exist in or around the project area. In order to identify such resources, CRM TECH conducted a historical/archaeological resources records search, pursued historical background research, contacted the State of California Native American Heritage Commission (NAHC), and carried out a systematic field survey. This report is a complete account of the methods, results, and final conclusion of the study. Personnel who participated in the study are named in the appropriate sections below, and their qualifications are provided in Appendix 1.

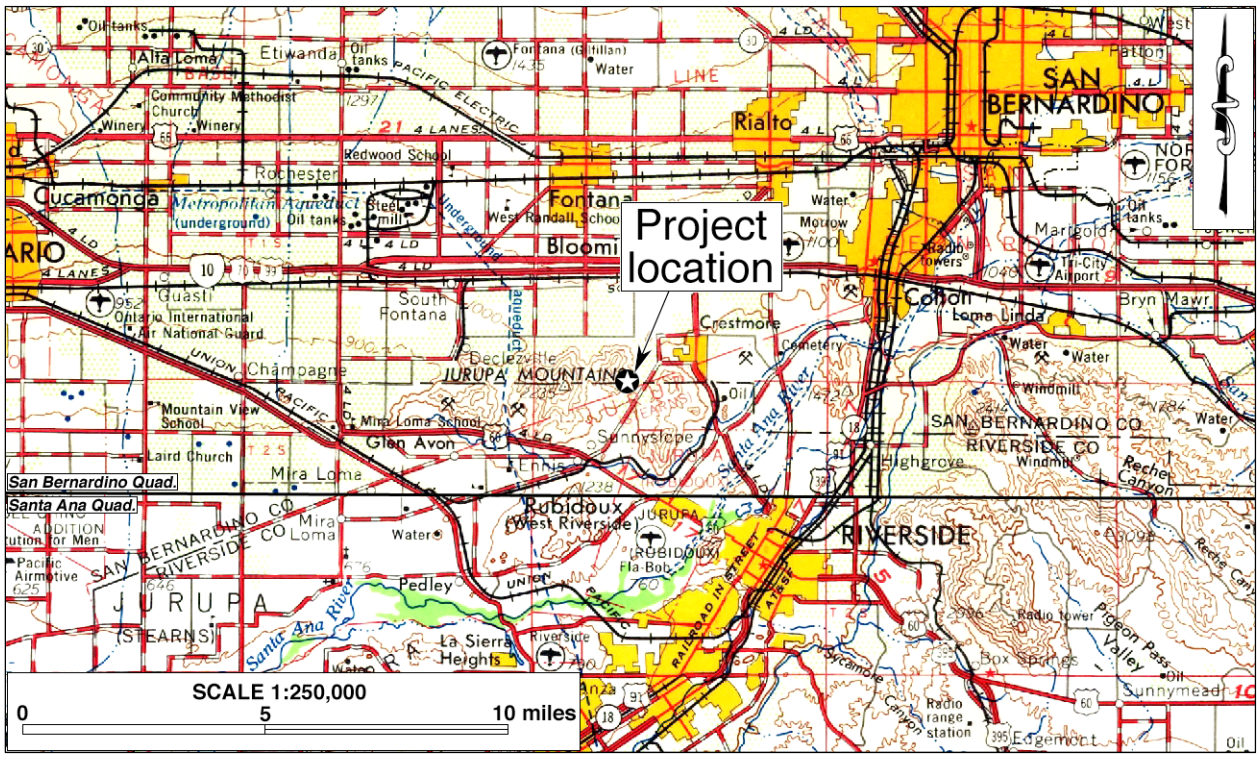



Figure 1. Project vicinity. (Based on USGS San Bernardino and Santa Ana, Calif., 1:250,000 quadrangles [USGS 1969, 1979])

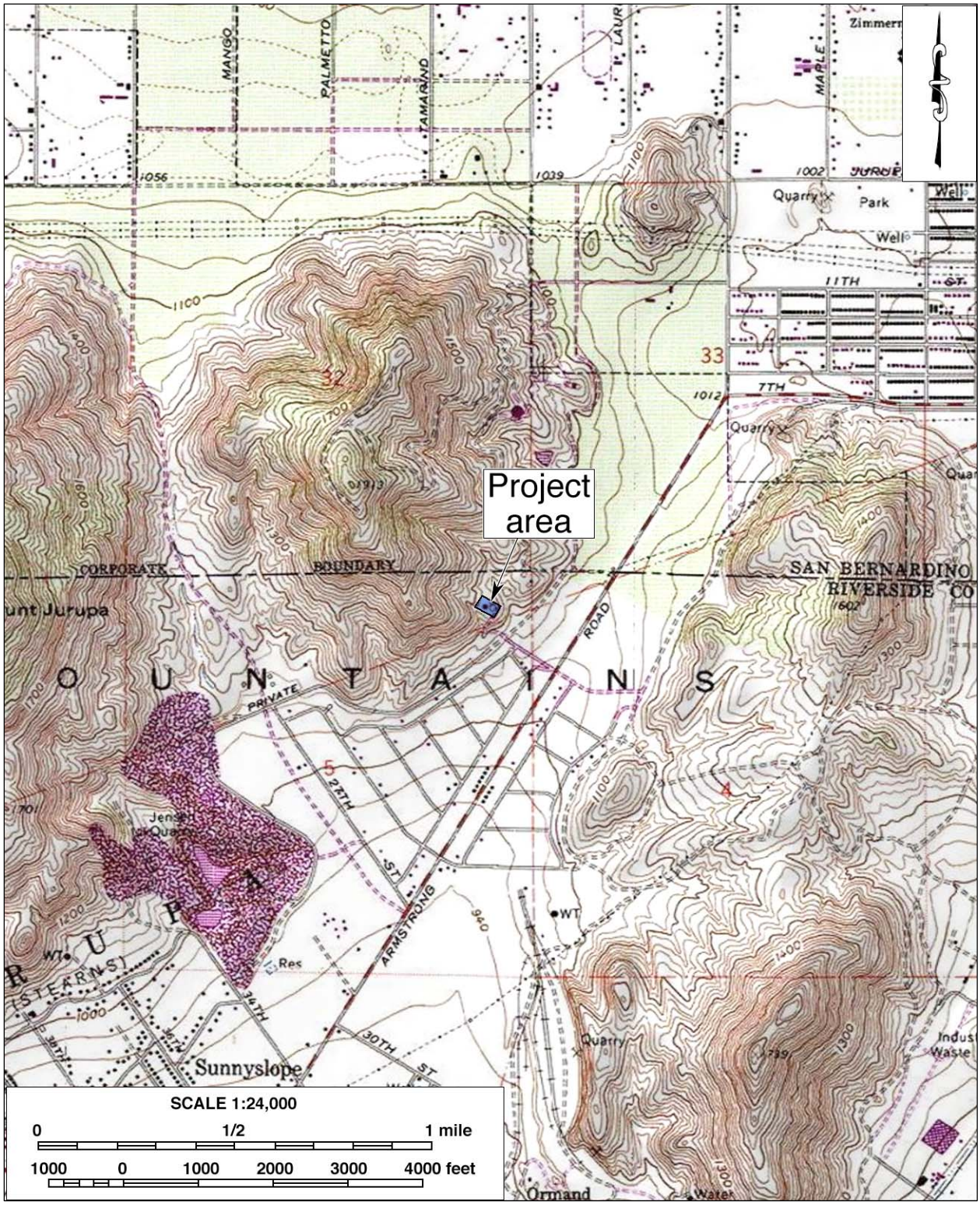



Figure 2. Project area. (Based on USGS Fontana, Calif., 1:24,000 quadrangle [USGS 1980])


Figure 3. Aerial image of the project area.

# SETTING

## CURRENT NATURAL SETTING

The project area consists of a generally rectangular-shaped tract of mostly undeveloped land situated on the east-facing slope of a hill in the Jurupa Mountains, a group of rocky knolls on the northwestern bank of the Santa Ana River. The natural landscape in the region features broad valleys divided by groups of hills. The overall environment is characterized by the temperate Mediterranean climate, with seasonal average temperatures ranging between 35 and 90 degrees Fahrenheit. Rainfall is typically less than 20 inches annually, most of which occurs between November and March.

The project area overlooks a residential neighborhood to the east and the southeast and is surrounded by undeveloped hilly land. Elevations in the project area range approximately from 1,130 feet to 1,185 feet above mean seal level. The terrain in the project area features mostly rugged slopes covered by a dense growth of vegetation, with the exception of the leveled and asphalt-paved pad for the existing 0.21-MG reservoir (Fig. 4). The reservoir occupies the northwest portion of the project area, with a larger, 1.0-MG reservoir standing approximately 35 feet further to the northwest and outside the project boundaries (Fig. 3). The surficial soils are composed of brown silty loam with meta-volcanic and angular granitic rocks, and the vegetation includes wild sage, rosemary, buck wheat, and other grasses and shrubs (Fig. 4).

Figure 4. Typical landscapes in the project area. *Left*: weed-covered slope, view to the southwest from the northeastern corner of the project area; *right*: level pad of the existing water tank, view to the south. (Photographs taken on December 28, 2018)

## CULTURAL SETTING

### Prehistoric Context

The earliest evidence of human occupation in western Riverside County was discovered below the surface of an alluvial fan in the northern portion of the Lakeview Mountains, overlooking the San Jacinto Valley, with radiocarbon dates clustering around 9,500 B.P. (Horne and McDougall 2008).

Another site found near the shoreline of Lake Elsinore, close to the confluence of Temescal Wash and the San Jacinto River, yielded radiocarbon dates between 8,000 and 9,000 B.P. (Grenda 1997). Additional sites with isolated Archaic dart points, bifaces, and other associated lithic artifacts from the same age range have been found in the nearby Cajon Pass area of San Bernardino County, typically atop knolls with good viewsheds (Basgall and True 1985; Goodman and McDonald 2001; Goodman 2002; Milburn et al. 2008).

The cultural history of southern California has been summarized into numerous chronologies, including those developed by Chartkoff and Chartkoff (1984), Warren (1984), and others. Specifically, the prehistory of western Riverside County has been addressed by O'Connell et al. (1974), McDonald et al. (1987), Keller and McCarthy (1989), Grenda (1993), Goldberg (2001), and Horne and McDougall (2008). Although the beginning and ending dates of different cultural horizons vary regionally, the general framework of the prehistory of western Riverside County can be broken into three primary periods:

- Paleoindian Period (ca. 18,000-9,000 B.P.): Native peoples of this period created fluted spearhead bases designed to be hafted to wooden shafts. The distinctive method of thinning bifaces and spearhead preforms by removing long, linear flakes leaves diagnostic Paleoindian markers at tool-making sites. Other artifacts associated with the Paleoindian toolkit include choppers, cutting tools, retouched flakes, and perforators. Sites from this period are very sparse across the landscape and most are deeply buried.
- Archaic Period (ca. 9,000-1,500 B.P.): Archaic sites are characterized by abundant lithic scatters of considerable size with many biface thinning flakes, bifacial preforms broken during manufacture, and well-made groundstone bowls and basin metates. As a consequence of making dart points, many biface thinning waste flakes were generated at individual production stations, which is a diagnostic feature of Archaic sites.
- Late Prehistoric Period (ca. 1,500 B.P.-contact): Sites from this period typically contain small lithic scatters from the manufacture of small arrow points, expedient groundstone tools such as tabular metates and unshaped manos, wooden mortars with stone pestles, acorn or mesquite bean granaries, ceramic vessels, shell beads suggestive of extensive trading networks, and steatite implements such as pipes and arrow shaft straighteners.

**Ethnohistoric Context**

According to current ethnohistorical scholarship, the present-day Jurupa Valley area lies on the border between the traditional territories of three Native American groups: the Serrano of the San Bernardino Mountains, the Luiseño of the Perris-Elsinore region, and the Gabrielino of the San Gabriel Valley. Kroeber (1925:Plate 57) suggests that the Native Americans of the Riverside area were probably Luiseño, Reid (1968:8-9) states that they were Serrano, and Strong (1929:7-9, 275) claims that they were Gabrielino. In any case, there also occurred a late influx of Cahuilla during the 19th century (Bean 1978).

Whatever the linguistic affiliation, Native Americans along the Santa Ana River exhibited similar social organization and resource procurement strategies. Villages were based on clan or lineage groups. Their home/base sites are marked by midden deposits, often with bedrock mortar features. During their seasonal rounds to exploit plant resources, small groups often ranged some distances in

search of specific plants and animals. Their gathering strategies often left behind signs of special use sites, usually grinding slicks on bedrock boulders, at the locations of the resources.

**Historic Context**

The Jurupa Valley area received its first European visitors during the early and mid-1770s, shortly after the beginning of Spanish colonization of Alta California in 1769 (Beck and Haase 1974:15). Despite these early contacts, no Europeans are known to have settled in the area until after the creation of the Rancho Jurupa land grant in 1838, which encompassed most of the present-day City of Jurupa Valley and the northern portion of the adjacent City of Riverside (Patterson 1996:121). One of the principal *rancherías* under Mission San Gabriel before the beginning of secularization in 1834, Rancho Jurupa was granted to Juan Bandini, who was administrator of Mission San Gabriel and all its lands at the time (Gunther 1984:259).

Within a few years after receiving the land grant, Bandini divided his vast domain into two parts and sold them to two prominent Yankee-turned-*ranchéros*, Benjamin D. "Benito" Wilson, and Bandini's son-in-law Abel Stearns (Gunther 1984:259-260). As a result, after the annexation of Alta California by the United States in 1848, the original land grant was confirmed as two separate entities, the 6,750-acre Rancho Jurupa (Rubidoux) and the 25,519-acre Rancho Jurupa (Stearns). The project area, however, was not included in the Rancho Jurupa land grant, and thus remained unclaimed public land when California became a part of the United States in 1848.

During the Rancho Period, stock raising was the primary economic activity in the Jurupa Valley area, much as elsewhere in southern California. In 1873-1875, the area received a major boost in growth when the navel orange was introduced. Its instant success led to the rapid spread of citrus cultivation throughout southern California and propelled the nearby town of Riverside to the forefront of the booming citrus industry. In the 1880s, a land boom swept through much of southern California, and most of the communities in the Jurupa Valley area trace their roots to that period and its immediate aftermath. Beginning in 1887, the area was known generally as West Riverside, a name that in later years became associated mainly with what is now Rubidoux (Gunther 1984:567).

By 1893, the young city of Riverside had grown into enough of a local political force to split itself from San Bernardino County, bringing what is now Jurupa Valley into the newly created Riverside County. During the 20th century, while much of southern California was increasingly urbanized, the Jurupa Valley area retained its agriculture-dominated economy and life-style on the rural periphery of the City of Riverside. In more recent decades, however, incremental suburbanization has accelerated and gradually transformed the landscape in this area. In 2011, the small communities scattered across some 43.5 square miles to the north of Riverside jointly incorporated as the City of Jurupa Valley.

In the meantime, the Jurupa Community Services District formed in 1956 to provide sewer service to the area and then began to provide domestic water supply in 1966 (JCSD n.d.). The district later expanded its service area and scope of services to include streetlight maintenance, frontage landscape maintenance, graffiti abatement, and parks and recreation (*ibid.*). Today, JCSD serves around 130,000 residents across northwestern Riverside County, including the City of Eastvale and the majority of the City of Jurupa Valley (*ibid.*).

# RESEARCH METHODS

## RECORDS SEARCH

On December 13 and 19, 2018, CRM TECH archaeologist Nina Gallardo completed the records search at the Eastern Information Center (EIC) and the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System. Located on the campus of the University of California, Riverside, and California State University, Fullerton, respectively, EIC and SCCIC are the official cultural resource records repositories for the Counties of Riverside and San Bernardino, respectively. The dual-county records search was necessitated by the project's location in close proximity to the county line.

During the records search, Gallardo examined maps and records on file at EIC and SCCIC for previously identified cultural resources and existing cultural resources reports within a one-mile radius of the project area. Previously identified cultural resources include properties designated as California Historical Landmarks, Points of Historical Interest, or Riverside/San Bernardino County Historical Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resources Inventory.

## NATIVE AMERICAN PARTICIPATION

On December 12, 2018, CRM TECH submitted a written request to the Native American Heritage Commission for a records search in the commission's Sacred Lands File. NAHC is the state trustee agency for the protection of Native American cultural resources pursuant to CEQA, tasked with identifying and cataloging Native American cultural resources, including places of special religious or social significance and known graves/cemeteries. The correspondence between CRM TECH and NAHC is attached to this report as Appendix 2. In addition to the contact with NAHC, CRM TECH also notified the nearby Soboba Band of Luiseño Indians of the upcoming archaeological fieldwork and invited tribal participation.

## HISTORICAL RESEARCH

Historical background research for this study was conducted by CRM TECH historian Terri Jacquemain. Sources consulted during the research included published literature in local and regional history, U.S. General Land Office (GLO) land survey plat maps dated 1873-1878, U.S. Geological Survey (USGS) topographic maps dated 1901-1980, and aerial photographs taken in 1938-2018. The historic maps are collected at the Science Library of the University of California, Riverside, and the California Desert District of the U.S. Bureau of Land Management, located in Moreno Valley. The aerial photographs are available at the Nationwide Environmental Title Research (NETR) Online website and through the Google Earth software.

## FIELD SURVEY

On December 28, 2018, CRM TECH archaeologist Salvadore Boites carried out the field survey of the project area. Native American monitor John Torres participated in the fieldwork on behalf of the

Cultural Resource Department of the Soboba Band of Luiseno Indians. Approximately 75% of the property was surveyed at an intensive level by walking a series of parallel north-south transects spaced 15 meters (approximately 50 feet) apart. The remaining 25% of the project area, specifically the fenced pad of the existing tanks to which full access could not be obtained, was surveyed at a reconnaissance level through a visual inspection from the perimeters (Fig. 4). In this way, the ground surface in the entire project area was systematically examined for any evidence of human activities dating to the prehistoric or historic period (i.e., 45 years ago or older). Ground visibility varied from poor to fair (0-50%) depending on the density of the vegetation and the presence or absence of pavement.

## RESULTS AND FINDINGS

### RECORDS SEARCH

According to EIC and SCCIC records, three previous cultural resources studies covered all or portions of the project area between 1980 and 2007, including a 1989 survey completed prior to the installation of the adjacent 1.0-MG water tank (#0979, #2594, and #7460 in Fig. 5), but no cultural resources have been recorded within or adjacent to the project boundaries. Now more than ten years old, these past studies are considered outdated for regulatory compliance purposes. Therefore, a systematic resurvey of the project area was deemed necessary for this study.

Outside the project area but within the one-mile radius, EIC and SCCIC records show at least 26 other previous studies on various tracts of land and linear features (Fig. 5). In all, more than half of the land within the scope of the records search has been surveyed, which resulted in the identification of 21 historical/archaeological sites and six isolates—i.e., localities with fewer than three artifacts—within the one-mile radius. Sixteen of the sites and four of the isolates were of prehistoric—i.e., Native American—origin, consisting mainly of bedrock milling features but also including a few clusters of habitation debris. All of them were located a half-mile or more from the project area. The nearest among them, Site 33-003494, represented two bedrock milling features with a total of six grinding slicks, located some 0.55 mile to east.

The other five sites and two isolates dated to the historic period and included power transmission lines, a quarry complex, and scattered refuse items. None of the 21 sites and six isolates was found in the immediate vicinity of the project area, and thus none of them requires further consideration during this study.

### NATIVE AMERICAN PARTICIPATION

In response to CRM TECH's inquiry, NAHC reported in a letter dated December 18, 2018, that the Sacred Lands File identified no Native American cultural resources within the project area but recommended that local Native American groups be contacted for further information. For that purpose, NAHC provided a referral list with three potential contacts in the region. The letter and the referral list from NAHC are attached to this report in Appendix 2 for reference by JCSD in future Native American consultations.

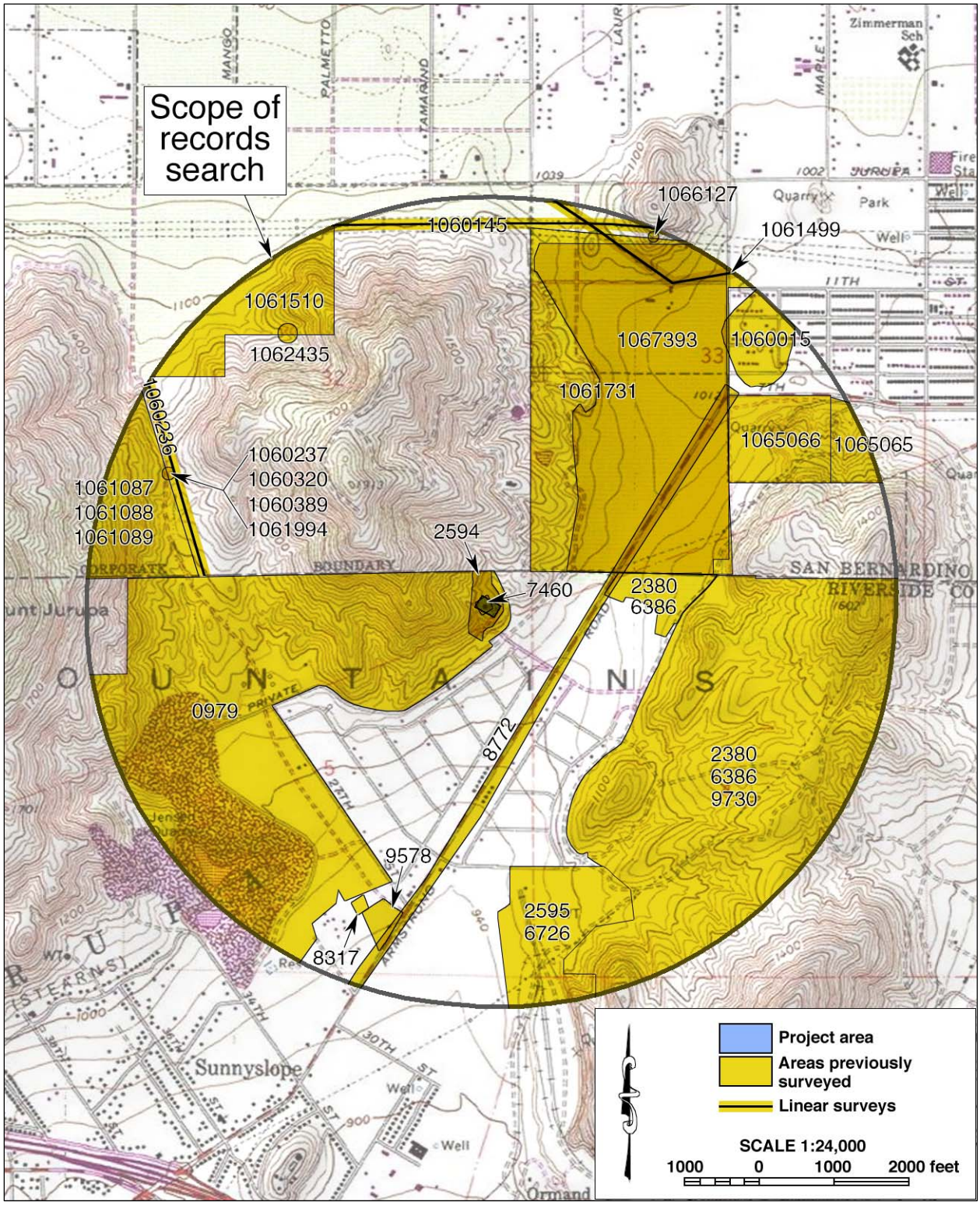



Figure 5. Previous cultural resources studies in the vicinity of the project area, listed by EIC and SCCIC file number. Locations of historical/archaeological sites are not shown as a protective measure.

## HISTORICAL RESEARCH

Historical sources consulted for this study indicate that the two existing water tanks are the only notable man-made features to have been present within or adjacent to the project area (Figs. 6-9; NETR Online 1938-1994). The 0.21-MG reservoir in the project area was built in 1977 (Webb Associates 1977), and the 1.0-MG reservoir outside the project boundaries was built around 1990 (Drover 1989). Prior to that, the project location may have been a part of the Jensen Quarry to the south (NETR Online 1948). During World Wars I and II, the quarry produced marble for cement production by the Riverside Cement Company, which also owned the well-known Crestmore deposit a few miles to the east (Hudson Institute of Mineralogy n.d.).

After reopening and closing a few more times, the Jensen Quarry finally ceased all operations in 1979, and its main facility was turned into the Oak Quarry Golf Club in the 1990s (Hudson Institute of Mineralogy n.d.). The quarry activities at and near the project location, however, had evidently waned shortly after WWII, and by 1959 the land had largely returned to its natural state (NETR Online 1948; 1959). In the surrounding area, the level lands at the foot of the hill were used for agriculture during the 1930s-1950s (NETR Online 1938-1959). Although the emergence of streets by the late 1950s suggested upcoming residential development, the actual construction of the homes in the neighborhood occurred only after 1967, and mostly after 1980 (NETR Online 1959-1994).

## FIELD SURVEY

The field survey produced completely negative results for potential "historical resources," and no buildings, structures, objects, sites, features, or artifacts of prehistoric or historical origin were found within or adjacent to the project area. The ground surface exhibited no surviving evidence of past involvement in quarry operations, and the two existing steel water tanks in and near the project boundaries are both clearly modern structures of standard design and construction.

# DISCUSSION

The purpose of this study is to identify any cultural resources within the project area and to assist JCSD in determining whether such resources meet the official definition of "historical resources" as provided in the California Public Resources Code, in particular CEQA. According to PRC §5020.1(j), "'historical resource' includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California."

More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the lead agency (Title 14 CCR §15064.5(a)(1)-(3)). Regarding the proper criteria for the evaluation of historical significance, CEQA guidelines mandate that "generally a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

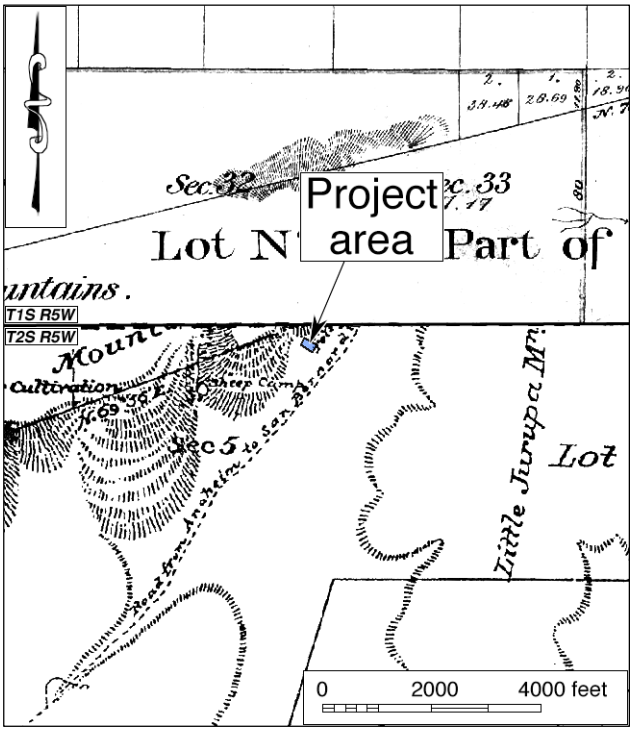



Figure 6. The project area and vicinity in 1853-1878. (Source: GLO 1873; 1878)

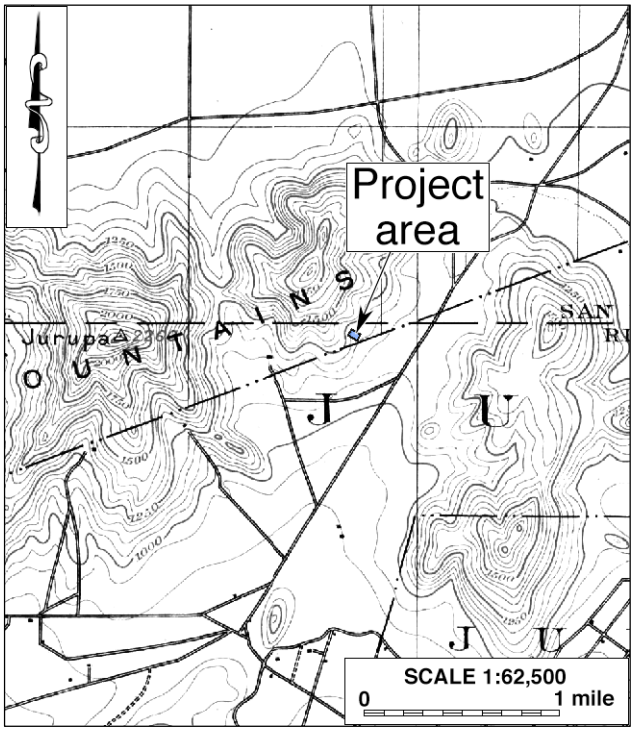



Figure 7. The project area and vicinity in 1893-1894. (Source: USGS 1901)

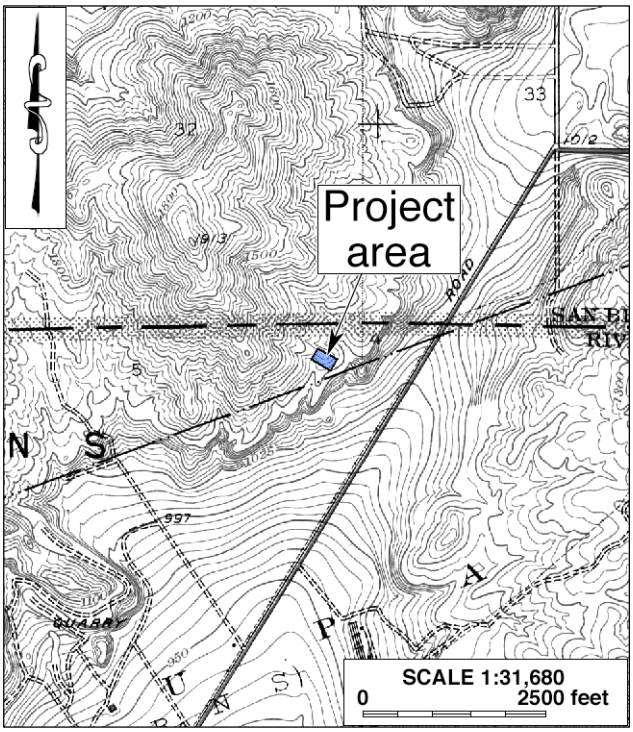



Figure 8. The project area and vicinity in 1938. (Source: USGS 1943)

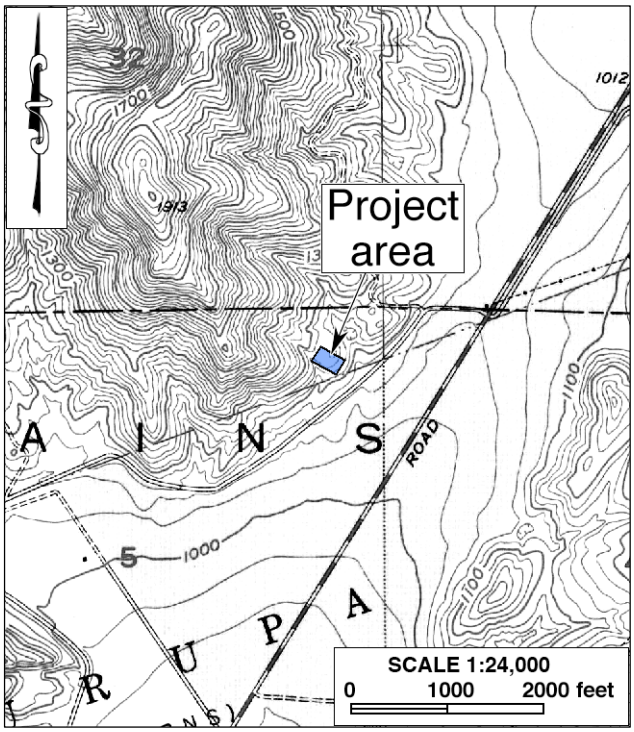



Figure 9. The project area and vicinity in 1952-1953. (Source: USGS 1953)

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

In summary of the research results presented above, no potential "historical resources" were previously recorded within or adjacent to the project area, and none were found during the present survey. The existing 0.21-MG reservoir in the project area and the adjacent 1.0-MG reservoir date to 1977 and circa 1990, respectively, and do not meet the age threshold to be considered historical in origin (i.e., more than 50 years of age). As common infrastructure features of standard design and construction, these simple steel tanks are utilitarian in character and demonstrate no remarkable architectural, engineering, artistic, or aesthetic qualities. Without any potential to qualify as "historical resources," they require no further consideration under CEQA provisions on cultural resources. Based on these findings, and in light of the significance criteria listed above, the present study concludes that no "historical resources" exist within or adjacent to the project area.

## CONCLUSION AND RECOMMENDATIONS

CEQA establishes that "a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (PRC §21084.1). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired."

As stated above, this study has concluded that no "historical resources," as defined by CEQA, are present within or adjacent to the project area. Therefore, CRM TECH presents the following recommendations to JCSD:

- The proposed project will not cause a substantial adverse change to any known "historical resources."
- No further cultural resources investigation will be necessary for the project unless construction plans undergo such changes as to include areas not covered by this study.
- If any buried cultural materials are encountered during earth-moving operations associated with the project, all work within 50 feet of the discovery should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

## REFERENCES

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Goodman, John D., II, and Meg McDonald
2001 Archaeological Survey of the Southern California Trials Association Event Area, Little Pine Flats, Mountaintop Ranger District, San Bernardino National Forest, California. San Bernardino National Forest Technical Report 05-12-BB-106. San Bernardino, California.
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## APPENDIX 1:
## PERSONNEL QUALIFICATIONS

### PRINCIPAL INVESTIGATOR/HISTORIAN
### Bai "Tom" Tang, M.A.

**Education**

| | |
|---|---|
| 1988-1993 | Graduate Program in Public History/Historic Preservation, UC Riverside. |
| 1987 | M.A., American History, Yale University, New Haven, Connecticut. |
| 1982 | B.A., History, Northwestern University, Xi'an, China. |
| 2000 | "Introduction to Section 106 Review," presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno. |
| 1994 | "Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno. |

**Professional Experience**

| | |
|---|---|
| 2002- | Principal Investigator, CRM TECH, Riverside/Colton, California. |
| 1993-2002 | Project Historian/Architectural Historian, CRM TECH, Riverside, California. |
| 1993-1997 | Project Historian, Greenwood and Associates, Pacific Palisades, California. |
| 1991-1993 | Project Historian, Archaeological Research Unit, UC Riverside. |
| 1990 | Intern Researcher, California State Office of Historic Preservation, Sacramento. |
| 1990-1992 | Teaching Assistant, History of Modern World, UC Riverside. |
| 1988-1993 | Research Assistant, American Social History, UC Riverside. |
| 1985-1988 | Research Assistant, Modern Chinese History, Yale University. |
| 1985-1986 | Teaching Assistant, Modern Chinese History, Yale University. |
| 1982-1985 | Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China. |

**Cultural Resources Management Reports**

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (with Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

**PRINCIPAL INVESTIGATOR/ARCHAEOLOGIST**
**Michael Hogan, Ph.D., RPA***

## Education

| | |
|---|---|
| 1991 | Ph.D., Anthropology, University of California, Riverside. |
| 1981 | B.S., Anthropology, University of California, Riverside; with honors. |
| 1980-1981 | Education Abroad Program, Lima, Peru. |
| 2002 | Section 106—National Historic Preservation Act: Federal Law at the Local Level. UCLA Extension Course #888. |
| 2002 | "Recognizing Historic Artifacts," workshop presented by Richard Norwood, Historical Archaeologist. |
| 2002 | "Wending Your Way through the Regulatory Maze," symposium presented by the Association of Environmental Professionals. |
| 1992 | "Southern California Ceramics Workshop," presented by Jerry Schaefer. |
| 1992 | "Historic Artifact Workshop," presented by Anne Duffield-Stoll. |

## Professional Experience

| | |
|---|---|
| 2002- | Principal Investigator, CRM TECH, Riverside/Colton, California. |
| 1999-2002 | Project Archaeologist/Field Director, CRM TECH, Riverside. |
| 1996-1998 | Project Director and Ethnographer, Statistical Research, Inc., Redlands. |
| 1992-1998 | Assistant Research Anthropologist, University of California, Riverside |
| 1992-1995 | Project Director, Archaeological Research Unit, U. C. Riverside. |
| 1993-1994 | Adjunct Professor, Riverside Community College, Mt. San Jacinto College, U.C. Riverside, Chapman University, and San Bernardino Valley College. |
| 1991-1992 | Crew Chief, Archaeological Research Unit, U. C. Riverside. |
| 1984-1998 | Archaeological Technician, Field Director, and Project Director for various southern California cultural resources management firms. |

## Research Interests

Cultural Resource Management, Southern Californian Archaeology, Settlement and Exchange Patterns, Specialization and Stratification, Culture Change, Native American Culture, Cultural Diversity.

## Cultural Resources Management Reports

Author and co-author of, contributor to, and principal investigator for numerous cultural resources management study reports since 1986.

## Memberships

* Register of Professional Archaeologists; Society for American Archaeology; Society for California Archaeology; Pacific Coast Archaeological Society; Coachella Valley Archaeological Society.

**PROJECT HISTORIAN/REPORT WRITER**
**Terri Jacquemain, M.A.**

## Education

| | |
|---|---|
| 2004 | M.A., Public History and Historic Resource Management, University of California, Riverside. |
| 2002 | B.S., Anthropology, University of California, Riverside. |
| 2001 | Archaeological Field School, University of California, Riverside. |
| 1991 | A.A., Riverside Community College, Norco Campus. |

## Professional Experience

| | |
|---|---|
| 2003- | Historian/Architectural Historian/Report Writer, CRM TECH, Riverside/Colton, California. |
| 2002-2003 | Teaching Assistant, Religious Studies Department, University of California, Riverside. |
| 2002 | Interim Public Information Officer, Cabazon Band of Mission Indians. |
| 2000 | Administrative Assistant, Native American Student Programs, University of California, Riverside. |
| 1997-2000 | Reporter, *Inland Valley Daily Bulletin*, Ontario, California. |
| 1991-1997 | Reporter, *The Press-Enterprise*, Riverside, California. |

## Membership

California Preservation Foundation.

## PROJECT ARCHAEOLOGIST
## Salvadore Boites, M.A.

### Education

2013 M.A., Applied Anthropology, California State University, Long Beach.
2003 B.A., Anthropology/Sociology, University of California, Riverside.

### Professional Experience

2003- Project Archaeologist, CRM TECH, Riverside/Colton, California.
2010-2011 Adjunct Instructor, Anthropology etc., Everest College, Anaheim, California.
2001-2002 Teaching Assistant, Moreno Elementary School, Moreno Valley, California.
1999-2003 Research Assistant, Anthropology Department, University of California, Riverside.

## PROJECT ARCHAEOLOGIST/NATIVE AMERICAN LIAISON
## Nina Gallardo, B.A.

### Education

2004 B.A., Anthropology/Law and Society, University of California, Riverside.

### Professional Experience

2004- Project Archaeologist, CRM TECH, Riverside/Colton, California.

- Surveys, excavations, construction monitoring, field recordation, mapping, records searches, and Native American liaison.

## APPENDIX 2

# CORRESPONDENCE WITH NATIVE AMERICAN HERITAGE COMMISSION

## SACRED LANDS FILE & NATIVE AMERICAN CONTACTS LIST REQUEST

### NATIVE AMERICAN HERITAGE COMMISSION

1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916)373-3710
(916)373-5471 Fax
nahc@pacbell.net

**Project:** Proposed JCSD Benedict Reservoir Tank Replacement Project (CRM TECH No. 3423)

**County:** Riverside

**USGS Quadrangle Name:** Fontana, Calif.

**Township** 2 South **Range** 5 West SB **BM; Section(s)** 5

**Company/Firm/Agency:** CRM TECH

**Contact Person:** Nina Gallardo

**Street Address:** 1016 E. Cooley Drive, Suite A/B

**City:** Colton, CA **Zip:** 92324

**Phone:** (909) 824-6400 **Fax:** (909) 824-6405

**Email:** ngallardo@crmtech.us

**Project Description:** The primary component of the project is to demolish of an existing 0.2-MG reservoir and replacement with a new 1.1-MG reservoir. The project area consists of approximately 1.5 acres located northwest of Sandra Drive and McLaren Lane, in a small portion of Assessor's Parcel Number 174-040-020, within the City of Jurupa Valley, Riverside County, California.

*December 12, 2018*

**STATE OF CALIFORNIA** **Edmund G. Brown, Jr., Governor**

**NATIVE AMERICAN HERITAGE COMMISSION**
**Cultural and Environmental Department**
**1550 Harbor Blvd., Suite 100 West Sacramento, CA 95691 Phone: (916) 373-3710**
**Email: nahc@nahc.ca.gov**
**Website: http://www.nahc.ca.gov**
**Twitter: @CA_NAHC**

December 18, 2018

Nina Gallardo
CRM TECH

VIA Email to: ngallardo@crmtech.us

RE: JCSD Benedict Reservoir Tank Replacement Project (CRM TECH No. 3423), Riverside County.

Dear Ms. Gallardo:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

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

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at my email address: katy.sanchez@nahc.ca.gov.
Sincerely,

Katy Sanchez

KATY SANCHEZ
Associate Environmental Planner

Attachment

**Native American Heritage Commission**
**Native American Contacts List**
**12/18/2018**

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 Gabrielino
Covina ,CA 91723
admin@gabrielenoindians.org
(626) 926-4131

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

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

**This list is current as of the date of this document and is based on the information available to the Commission on the date it was produced.**

**Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code,Section 5097.94 of the Public Resources Code, or Section 5097.98 of the Public Resources Code.**

**This list is only applicable for contacting local Native American Tribes for the proposed:**
**JCSD Benedict Reservoir Tank Replacement Project (CRM TECH No. 3423), Riverside County.**

# Appendix D

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

# GEOTECHNICAL INVESTIGATION REPORT

## NEW 1.1 MG BENEDICT WATER STORAGE TANK

CITY OF EASTVALE/JURUPA VALLEY, RIVERSIDE COUNTY, CALIFORNIA

*CONVERSE PROJECT NO. 18-81-276-01*

*Prepared For:*

ALBERT A. WEBB ASSOCIATES
3788 McCray Street
Riverside, CA 92506

*Presented By:*

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

July 18, 2019

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

July 18, 2019

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

Subject: **GEOTECHNICAL INVESTIGATION REPORT**
**New 1.1 MG Benedict Water Storage Tank**
City of Eastvale/Jurupa Valley, Riverside County, California
Converse Project No. 18-81-276-01

Dear Mr. Sackett:

Converse Consultants (Converse) is pleased to submit this geotechnical investigation report to assist with the design and construction of the New 1.1 MG Benedict Water Storage Tank, located in the City of Eastvale/Jurupa Valley, Riverside County, California. This report was prepared in accordance with our revised proposal dated November 30, 2018 and your Task Order Agreement No. 2018-2097 dated December 18, 2018.

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

We appreciate the opportunity to be of service to Albert A. Webb Associates. 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/JB/ZA/kvg

2021 Rancho Drive, Suite 1, Redlands CA 92373
Telephone: (909) 796-0544 ♦ Facsimile: (909) 796-7675 ♦ www.converseconsultants.com

## 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

James Burnham, PG
Project Geologist


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

## 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 New 1.1 1.0-million-gallon (MG) Benedict Water Storage Tank is located in the City of Eastvale/Jurupa Valley, Riverside County, California. The tank site is surrounded on all sides by vacant uneven terrain. There are ascending slopes to the northwest and southeast, and descending slopes to the northeast and southwest. The slope ratios vary from approximately 2H:1V (horizontal:vertical) to 4H:1V. The tank site is developed with two reservoirs and associated appurtenances. The existing 1.0 MG reservoir located on the northwestern side of the site will remain. The existing 0.2 MG reservoir on the southwest side of the site will be removed. The existing tanks are surrounded by asphalt-concrete pavement and a perimeter fence. The site is on a hill and accessed via paved access road from Lauren Lane.

- The proposed 1.1 MG tank will replace the existing 0.2 MG tank (located to the southeast of the existing 1.0 MG tank). The new tank will be 90 feet in diameter, 26 feet tall. It will have a floor elevation of approximately 1,182 feet, and a high-water elevation of 1,205 feet. Based on review of the available conceptual grading plan, grading for the new tank will require an approximately 6-foot-tall cut slope on the southeast side of the tank and minor fill slopes on the south and northeast sides. The cut slope is expected to encounter hard bedrock. The project also includes retaining wall (maximum height 6 feet), CRIB wall (height 15± feet), asphalt concrete pavement and associated on-site piping. We understand 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. The retaining wall will be founded on continuous spread footing.

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

- Four test pits (PT-1 through PT-4) were excavated using a backhoe equipped with 24-inch wide bucket on May 10, 2019 to investigate subsurface conditions at the proposed site. The test pits were terminated at depths between 4.0 and 9.5 feet bgs due to refusal on bedrock.

- The subsurface materials within the site consist of a mixture of sand, silt, gravel, cobbles and boulders, and bedrock. Gravel, cobbles and boulders up to 17 inches in largest dimension was encountered in all test pits. Decomposed

metasedimentary bedrock (Ms/MI) was encountered in all test pits. Bedrock generally excavated as silty sand with gravel until refusal was encountered.

- Groundwater was not encountered during the field investigation to the maximum explored depth of approximately 9.5 feet bgs. The current and historical high groundwater level at the site is not known but is anticipated to be deeper than 9.5 feet bgs. Groundwater is not expected to be encountered during construction of the proposed water tank. Shallow perched groundwater may be present locally, particularly following precipitation.

- The site is not located within currently designated State of California Earthquake Fault Zones. The potential for surface rupture resulting from the movement of faults is not known with certainty but is considered low.

- The water storage tank is not located within an area that has been evaluated for liquefaction potential by the State of California. Based on the presence of shallow bedrock, the potential for liquefaction and seismic settlement is considered low.

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

- The measured sand equivalents at the site were 24 and 27. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material.

- The sulfate contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category S0 for these sulfate concentrations. No concrete type restrictions are specified for exposure category S0. A minimum compressive strength of 2,500 psi is recommended. The chloride contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category C1 (concrete is exposed to moisture, but not to external sources of chlorides). For exposure category C1, ACI provides concrete 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 was 1,398 ohm-cm. This indicates that the tested soils are corrosive to ferrous metals in contact with the soil.

- According to the Caltrans Corrosion Guidelines (Caltrans, 2018), soils are considered corrosive if the pH is 5.5 or less, or chloride content is 500 parts per million (ppm) or greater, or sulfate content is 1,500 ppm or greater, or resistivity less than 2,000 ohm-cm. Based on the tested results, the site soils are considered corrosive. <u>Converse does not practice in the area of corrosion consulting. A qualified corrosion consultant should provide appropriate corrosion mitigation measures, for any ferrous metals in contact with the site soils.</u>

- Prior to the start of construction, the existing tank foundation should be demolished, and removed from the site. The excavation will be backfilled and recompacted prior to the construction of the new water tank. All existing underground utilities and appurtenances, if present, should be located within the project site. 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.

- We anticipate that the alluvial sediments across the site will be readily excavatable with conventional earth moving and trenching equipment.

- We understand that the construction of this project will require excavation within the bedrock layer. Bedrock excavation is presented in the Section 5.4.1, *Seismic Refraction Survey and Rippability*.

- Overexcavation recommendations are presented in the Section 9.2, *Overexcavation*.

- All fill placed below water tank pad and retaining wall footing should be compacted to at least 95 percent of the laboratory maximum dry density. All fill placed at the site other than below water tank pad and retaining wall footing should be compacted to at least 90 percent of the laboratory maximum dry densities as determined by ASTM Standard D1557 test method, unless a higher compaction is specified herein.

- 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.

- Footings for the water tank should be at least 18 inches in width and embedded to at least 30 inches below the lowest adjacent grade. Footings for the retaining wall 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 2,500 psf. This value may be increased by up to 33 percent for short-term (seismic/wind) loading.

- Due to the presence of shallow bedrock within the tank area, and the overexcavation requirements and compaction criteria, 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 0.75 inches or less over a horizontal distance of 45 feet.

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

- Asphalt concrete pavement recommendations are presented in the text of this report.

- 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 new water tank construction is feasible, 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

# 1.0 INTRODUCTION

This report contains the findings of the geotechnical investigation performed by Converse the New 1.1 MG Benedict Water Storage Tank, located in the City of Eastvale/Jurupa Valley, Riverside County, California. The approximate location of the Water Tank is shown in shown in Figure No. 1, *Approximate Project Location Map.*

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

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

# 2.0 PROJECT DESCRIPTION

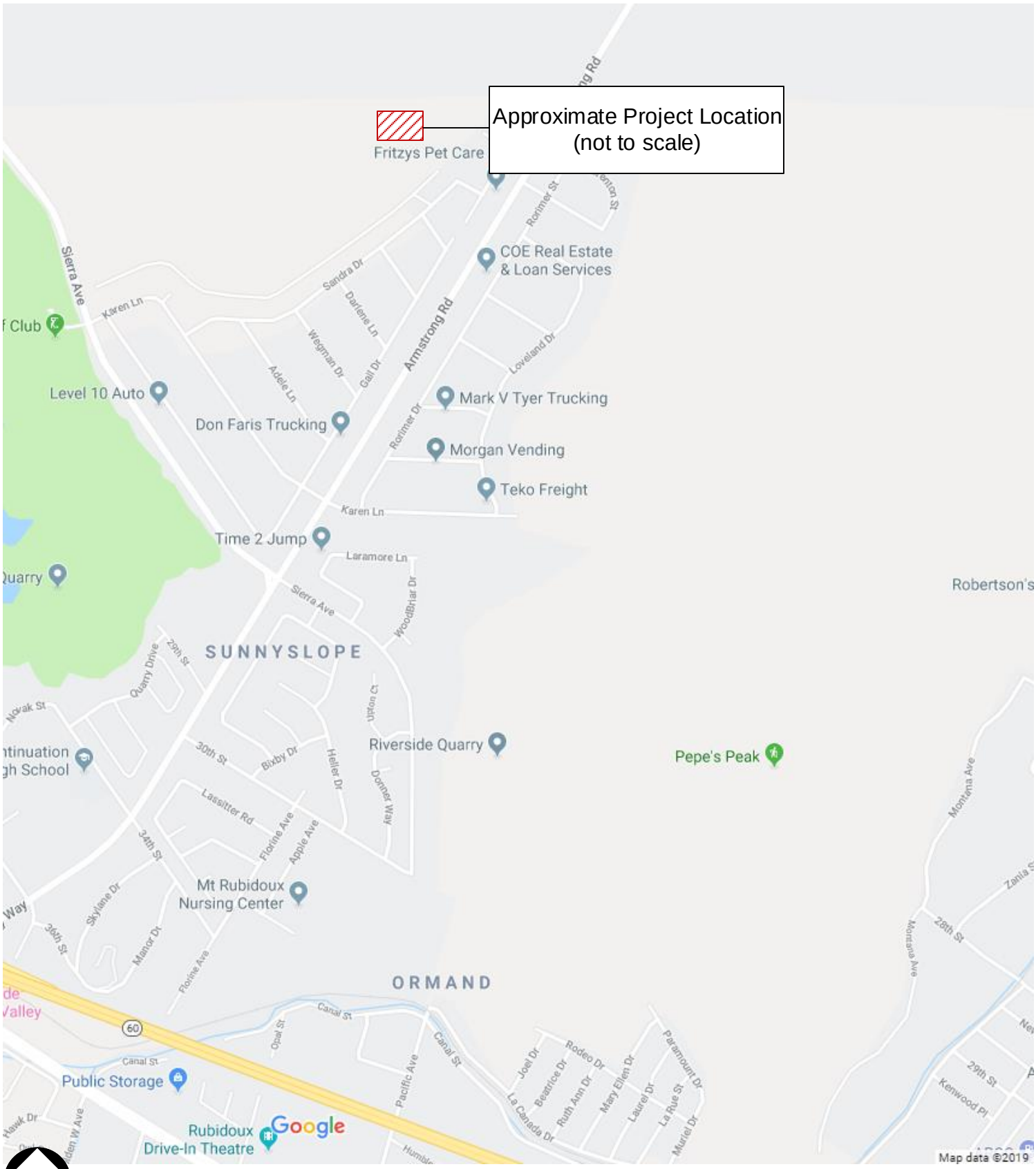
The Jurupa Community Services District (JCSD)'s 1200 Pressure Zone consists of a 1.0 MG reservoir and a 0.2 MG reservoir, both located at the Benedict tank site. The proposed 1.1 MG tank will replace the existing 0.2 MG tank (located to the southeast of the existing 1.0 MG tank). Grading and construction of the existing tanks required cut and fill slopes to create the tank pad. The existing tanks are surrounded by asphalt-concrete pavement.

The proposed new tank will be 90 feet in diameter and 26 feet tall, excluding the 3-foot-tall knuckle roof. It will have a floor elevation of approximately 1,182 feet, and a high-water elevation of 1,205 feet. Based on review of the available conceptual grading plan, grading for the new tank will require an approximately 6-foot-tall cut slope on the southeast side of the tank and minor fill slopes on the south and northeast sides. The cut slope is expected to encounter hard bedrock. The project also includes retaining wall (maximum height 6 feet), CRIB wall (height 15± feet), asphalt concrete pavement and associated on-site piping.

We understand 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. The retaining wall will be founded on continuous spread footing.

# 3.0 SITE DESCRIPTION

The tank site is surrounded on all sides by vacant uneven terrain. There are ascending slopes to the northwest and southeast, and descending slopes to the northeast and southwest. The slope ratios vary from approximately 2H:1V (horizontal:vertical) to 4H:1V.




# Approximate Project Location Map

Project: New 1.1 MG Benedict Water Storage Tank
Location: City of Eastvale/Jurupa Valley, Riverside County, California

Project No
18-81-276-01

For: Albert A. Webb Associates

**Converse Consultants**

FIGURE NO.
**1**

The tank site is developed with two reservoirs and associated appurtenances. The existing 1.0-million-gallon reservoir located on the northwestern side of the site will remain. The existing 0.2-million-gallon reservoir on the southwest side of the site will be removed. The existing tanks are surrounded by asphalt-concrete pavement and a perimeter fence. The site is on a hill and accessed via paved access road from Lauren Lane.

# 4.0 SCOPE OF WORK

The scope of this investigation included 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. Besides, pertinent information (the documents cited in Section 14, *References*) were used to understand the subsurface conditions and plan the investigation for this project.

## *4.2 Project Set-up*

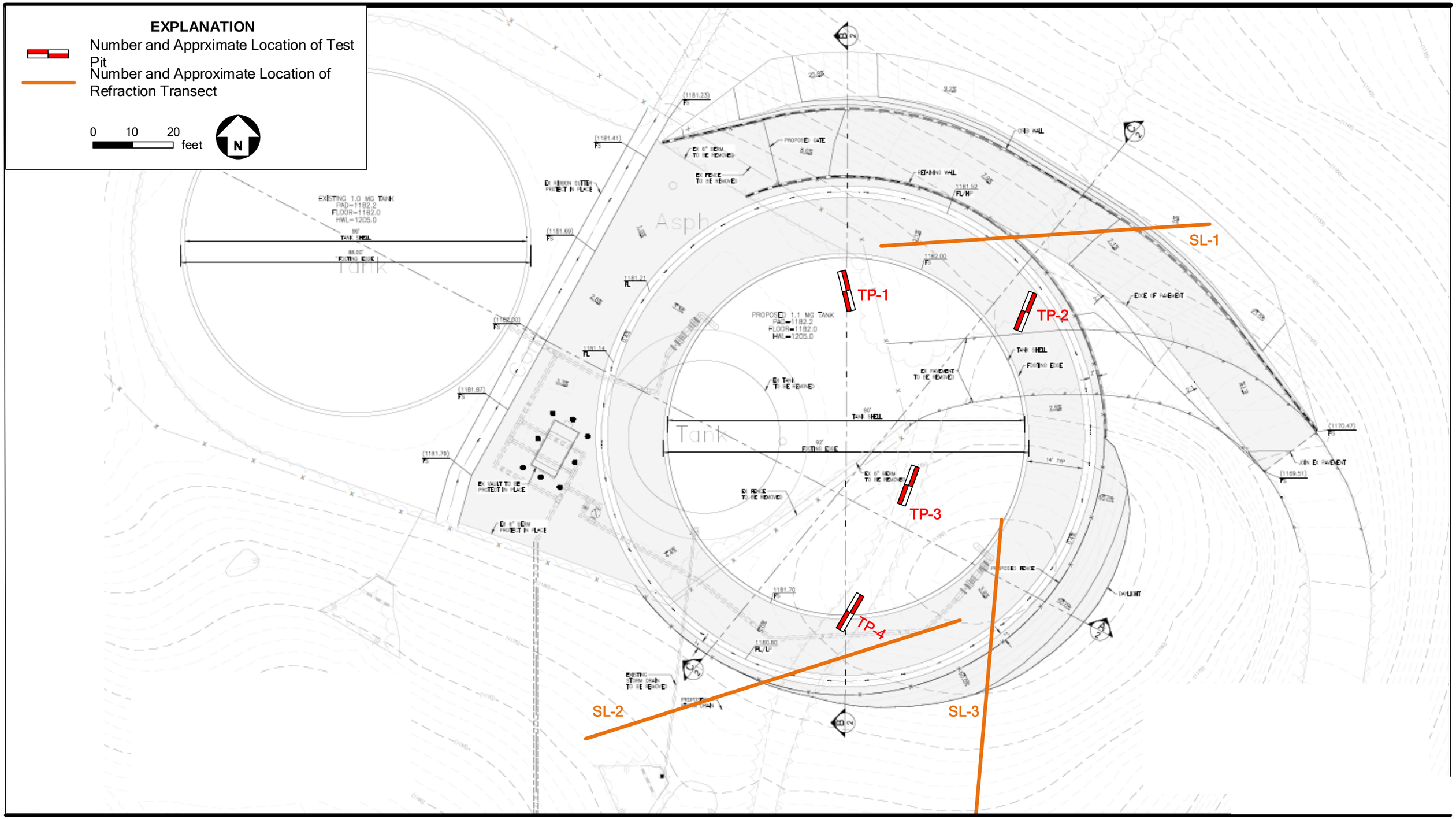
The following tasks were performed as part of the project setup.

- Conducted field reconnaissance to map the surface conditions at the site. We looked for exposed bedrock, existing slope (if any) conditions, vegetation, erosion, drainage patterns and any other visible feature which might impact the development of the site for its intended use.
- Marked the test pit locations in the field such that access to all locations was available.
- Notified Underground Service Alert (USA) at least 48 hours prior to investigation to clear the locations of any conflict with existing underground utilities.
- Engaged a backhoe contractor and a seismic refraction consultant.

## *4.3 Subsurface Exploration*

Four test pits (PT-1 through PT-4) were excavated using a backhoe equipped with 24-inch wide bucket on May 10, 2019 to investigate subsurface conditions at the proposed site. The test pits were terminated at depths between 4.0 and 9.5 feet bgs due to refusal on bedrock.

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




Project: New 1.1 MG Benedict Water Storage Tank
Location: City of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A Webb Associates

# Approximate Test Pit and Refraction Transect Locations Map

Project No
18-81-276-01

**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.

- Sand equivalent (ASTM D2419)
- Soil corrosivity (California Tests 643, 422, and 417)
- Grain size analysis (ASTM C136)
- Maximum dry density and optimum-moisture content (ASTM D1557)
- Direct shear (ASTM D3080)

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 was performed and this report was prepared to present our findings, conclusions and recommendations for the proposed water tank.

## 5.0 SITE CONDITIONS

A general description of the subsurface conditions and various materials encountered during our field exploration are presented in this section.

### *5.1 Subsurface Profile*

Based on the test pits and laboratory test results, the subsurface materials within the site consist of a mixture of sand, silt, gravel, cobbles and boulders, and bedrock. Gravel, cobbles and boulders up to 17 inches in largest dimension was encountered in all test pits. Decomposed metasedimentary bedrock (Ms/MI) was encountered in all test pits. Bedrock generally excavated as silty sand with gravel until refusal was encountered.

For a detailed description of the subsurface materials encountered in the test pits, see Drawings No. A-2 through A-5, *TP Cross Section,* in Appendix A, *Field Exploration.*

### *5.2 Groundwater*

Groundwater was not encountered during the field investigation to the maximum explored depth of approximately 9.5 feet bgs. The GeoTracker database (SWRCB, 2019) and the National Water Information System (USGS, 2019) were reviewed for groundwater data from sites within close proximity of the site, however, no sites with groundwater data were located.

The current and historical high groundwater level at the site is not known but is anticipated to be deeper than 9.5 feet bgs. Groundwater is not expected to be encountered during construction of the proposed water tank. Shallow perched groundwater may be present locally, particularly following precipitation.

### *5.3 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 at the site, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the test pit locations.

### *5.4 Excavatability*

We anticipate that the alluvial sediments across the site will be readily excavatable with conventional earth moving and trenching equipment.

The phrase “conventional heavy-duty excavation equipment” is intended to include commonly used equipment such as excavators, scrapers, 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.

We understand that the construction of this project will require excavation within the bedrock layer.

#### 5.4.1 Seismic Refraction Survey and Rippability

Southwest Geophysics, Inc. was retained to perform a seismic refraction survey for the purpose of evaluating bedrock rippability. Three seismic refraction traverses were conducted at selected locations based on proposed structure depths. Their complete report, including seismic refraction profiles and maps of the seismic traverse locations, is presented in Appendix D, *Seismic Refraction Survey*.

Rippability can generally be estimated based on the seismic P-wave velocity through a subsurface material. Generalized rippability classifications are given in the following table.

**Table No. 1, Rippability Classification**

| Seismic P-wave Velocity | Rippability |
|---|---|
| 0-2,000 feet/second | Easy |
| 2,000 to 4,000 feet/second | Moderate |

| Seismic P-wave Velocity | Rippability |
|---|---|
| 4,000 to 5,500 feet/second | Difficult, Possible Blasting |
| 5,500 to 7,000 feet/second | Very Difficult, Probable Blasting |
| Greater than 7,000 feet/second | Blasting Generally Required |

Based on the seismic refraction and soil test pits data, the depth at which difficult excavation will be encountered is expected to vary significantly at the project site, sometimes over short distances.

The upper 10 feet of velocity data generally indicates that excavation will be easy to moderately difficult for the first 2-4 feet and moderately difficult beyond 4 feet.

The difficulty of excavation will increase with depth as the degree of rock weathering decreases. The use of specialized equipment or techniques, such as hydraulic hammers ("breakers"), jackhammers, heavy-duty excavators with suitable rippers, or non-explosive rock reduction methods such as expansive grouts, should be anticipated in deeper excavations as discussed above. Appropriate excavation equipment should be selected by an experienced earthwork contractor. Determination of the appropriate equipment may require test excavations in representative areas.

Based on our review of the seismic refraction data, and our experience with excavations in the site vicinity, we anticipate that corestones, or boulders of relatively unweathered rock, will be encountered embedded within the weathered bedrock, particularly in deeper excavations. Large or nested corestones will reduce excavation rates. Rock reduction techniques will be required to excavate and move very large corestones.

# 6.0 ENGINEERING GEOLOGY

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

## *6.1 Regional Geology*

The project site is located within the Northern Perris Block region in the Northern Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province consists of a series of northwest-trending mountain ranges and valleys bounded on the north by the San Bernardino and San Gabriel Mountains, on the west by the Los Angeles Basin, and on the southwest by the Pacific Ocean.

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

be active during Quaternary time.

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

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

### *6.2 Site Geology*

The project is located approximately 2.8 miles northwest of the active Santa Ana River Channel in the foothills of Mount Jurupa. Regional mapping (Morton and Miller, 2006) indicates that the subsurface at the project site is comprised of Paleozoic-aged metasedimentary schist and gneiss. The bedrock is capped by a layer of alluvial silty sand with gravel, cobbles, and boulders. The alluvial layer varies in thickness.

## 7.0 FAULTING AND SEISMICITY

The location of the project in relation to active faults and their seismic activity is discussed below.

### *7.1 Faulting*

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. Review of recent seismological and geophysical publications indicates that the seismic hazard for the project is high.

The project site is not located within a currently mapped State of California Earthquake Fault Zone for surface fault rupture. Table No. 2, *Summary of Regional Faults,* summarizes selected data of known faults capable of seismic activity within 50 kilometers of the site. The data presented below was calculated using the National Seismic Hazard Maps Database (USGS, 2008) and other published geologic data.

**Table No. 2, Summary of Regional Faults**

| Fault Name and Section | Closest Distance (km) | Slip Sense | Length (km) | Slip Rate (mm/year) | Maximum Magnitude |
|---|---|---|---|---|---|
| San Jacinto | 11.53 | strike slip | 241 | n/a | 7.88 |
| Cucamonga | 15.82 | thrust | 28 | 5 | 6.70 |
| San Andreas (Southern) | 20.30 | strike slip | 548 | n/a | 8.18 |
| Chino, alt 1 | 25.27 | strike slip | 24 | 1 | 6.70 |
| Chino, alt 2 | 25.32 | strike slip | 29 | 1 | 6.80 |
| San Jose | 26.59 | strike slip | 20 | 0.5 | 6.70 |
| Elsinore | 27.15 | strike slip | 241 | n/a | 7.89 |
| Cleghorn | 28.21 | strike slip | 25 | 3 | 6.80 |
| Sierra Madre Connected | 31.27 | reverse | 76 | 2 | 7.30 |
| Sierra Madre | 31.27 | reverse | 57 | 2 | 7.20 |
| North Frontal (West) | 34.42 | reverse | 50 | 1 | 7.20 |
| Puente Hills (Coyote Hills) | 44.06 | thrust | 17 | 0.7 | 6.90 |
| Clamshell-Sawpit | 45.59 | reverse | 16 | 0.5 | 6.70 |

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

### *7.2 CBC Seismic Design Parameters*

Seismic parameters based on the California Building Code (CBC, 2016) provided in the following table were determined using the Seismic Design Maps application (OSHPD, 2019). Because S1 ≤ 0.6, a site-specific seismic design analysis is not required.

**Table No. 3, CBC 2016 Seismic Design Parameters**

| Seismic Parameters | |
|---|---|
| Coordinates | 34.0329°N, 117.4198°W |
| Site Class | C |
| Risk Category | IV |
| Mapped Short period (0.2-sec) Spectral Response Acceleration, $S_s$ | 1.500g |
| Mapped 1-second Spectral Response Acceleration, $S_1$ | 0.600g |
| Site Coefficient (from Table 1613.5.3(1)), $F_a$ | 1.0 |
| Site Coefficient (from Table 1613.5.3(2)), $F_v$ | 1.3 |
| MCE 0.2-sec period Spectral Response Acceleration, $S_{Ms}$ | 1.500g |
| MCE 1-second period Spectral Response Acceleration, $S_{M1}$ | 0.780g |
| Design Spectral Response Acceleration for short period $S_{ds}$ | 1.000g |
| Design Spectral Response Acceleration for 1-second period, $S_{d1}$ | 0.520g |
| Long-period transition period in seconds, $T_L$ | 8 |
| Peak Ground Acceleration ($PGA_M$) | 0.507g |

### *7.3 Secondary Effects of Seismic Activity*

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

**Surface Fault Rupture*:*** The site is not located within currently designated State of California Earthquake Fault Zones (CGS, 2007). The potential for surface rupture resulting from the movement of faults is not known with certainty but is considered low.

**Liquefaction:** Liquefaction is defined as the phenomenon in which a cohesion-less soil mass suffers a substantial reduction in its shear strength due to 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 located within 50 feet of the ground surface 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
- Soils must be relatively near the ground surface
- Ground motion must be intense
- Duration of shaking must be sufficient for the soils to lose shear resistance

The reservoir is not located within an area that has been evaluated for liquefaction potential by the State of California. Based on the presence of shallow bedrock, the potential for liquefaction is considered low.

**Seismic Settlement**: Seismically induced settlement occurs during ground shaking associated with earthquakes. Based on the presence of shallow bedrock, the potential for liquefaction is considered low.

**Landslides:** Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. The site is near the base of the foothills of Mount Jurupa. The slopes surrounding the site were visually inspected and do not show signs of oversteepening or recent landslides. The risk of landsliding during a large seismic event is not known with certainty but is considered low.

**Lateral Spreading:** Seismically induced lateral spreading involves primarily lateral movement of earth materials over deeper layers which have 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 absence of liquefaction potential, the site is not considered susceptible to lateral spreading.

**Tsunamis:** Tsunamis are large waves generated in large bodies of water by fault displacement or major ground movement. Based on the inland location of the site, tsunamis do not pose a hazard.

**Seiches:** Seiches are large waves generated in enclosed bodies of water in response to ground shaking. There is no potential for offsite seiching to affect the site. Seiching within the reservoir during a large earthquake may result in flooding of the site.

**Earthquake-Induced Flooding:** Dams or other water-retaining structures may fail as a result of large earthquakes, resulting in flooding. Discharges resulting from failure of regional dams would be conveyed by the Santa Ana River channel. Based on the position of the tank site in relation to the Santa Ana River, the risk of earthquake induced flooding at the reservoir site due to failure of offsite structures 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*. The results are also discussed below.

- Sand Equivalent – Two 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 24 and 27.
- Grain Size Analysis – Three representative samples were tested to determine the relative grain size distribution in accordance with the ASTM Standard D6913. The test results are graphically presented in Drawing No. B-1, *Grain Size Distribution Results.* Based on the test results, soils are typically silty sand.
- Maximum Dry Density and Optimum Moisture Content – Typical moisture-density relationships of two representative samples were conducted in accordance with ASTM D1557. The results are presented in Drawing No. B-2, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program*. The laboratory maximum dry densities were 125.0 and 127.0 (130.0 with rock correction) pounds per cubic foot (pcf) and the optimum moisture contents of 10.0 and 9.5 (8.6 with rock correction) percent.
- Direct Shear – Two direct shear tests were performed under soaked moisture condition on samples remolded to 90 percent of the laboratory maximum dry density. Each test was performed in accordance with ASTM Standard D3080. In

order to prepare remolded samples, laboratory maximum dry density performed for this project was utilized. 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*.

### *8.2 Chemical Testing - Corrosivity Evaluation*

One representative site soil sample was tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purposes of these tests were to determine the corrosion potential of site soils when placed in contact with common pipe materials. These tests were performed by 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.

- The pH measurement of the tested sample was 8.4.
- The sulfate content of the tested sample was 0.0133 percent by weight (133 ppm).
- The chloride concentration of the tested sample was 40 ppm.
- The minimum electrical resistivity when saturated was 1,398 ohm-cm.

## 9.0 EARTHWORK RECOMMENDATIONS

Earthwork recommendations for the site are presented in the following sections.

### *9.1 General*

This section contains our general recommendations regarding earthwork and grading for the proposed water 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, and removed from the site. The excavation will be backfilled and recompacted in accordance with these geotechnical recommendations and the project specifications prior to the construction of the new water tank. All existing underground utilities and appurtenances, if present, should be located within the project site. 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 Overexcavation*

Water tank and retaining wall footings, tank slab and pavement should be uniformly supported by compacted fill. In order to provide uniform support, structural areas should be overexcavated, scarified, and recompacted as follows. Based on our discussion with Bradley A. Sackett and Dave M. Algranti (Albert A. Webb Associates), the following recommendations are provided.

**Table No. 4, Overexcavation Depths**

| Structure | Minimum Overexcavation Depth |
|---|---|
| Tank Ring Wall Footing | As noted below |
| Retaining Wall Footing | 2 feet below footings bottom |
| Pavement | 12 inches below finish grade |

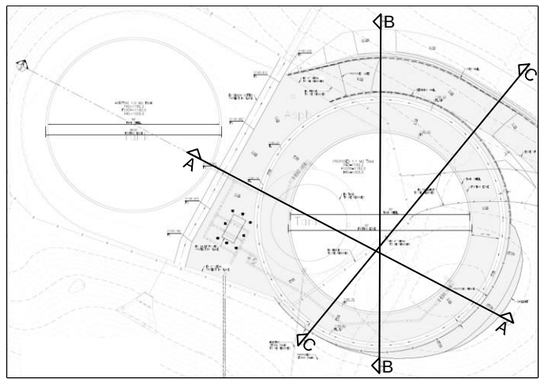
The tank ring wall footing should be founded on a minimum of 3 feet of compacted fill. This should be achieved by the following.

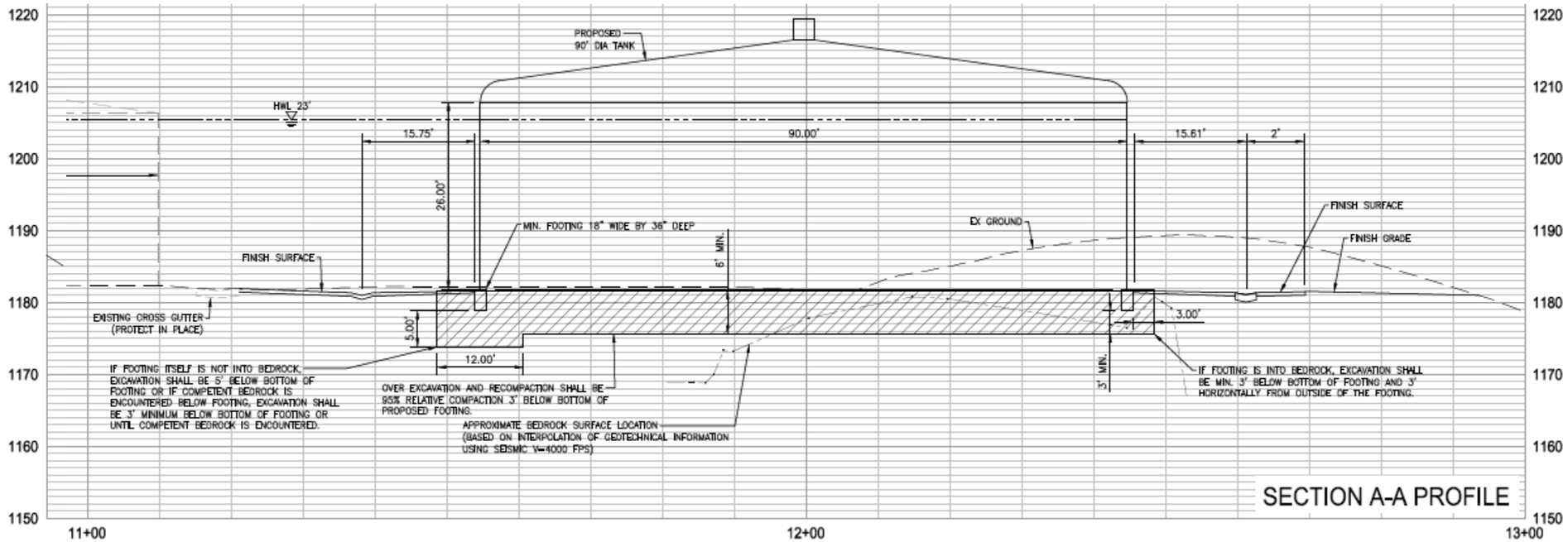
- If the footing excavation extends into bedrock, the overexcavation shall extend a minimum of 3 feet below the bottom of the footing and 3 feet horizontally from the edge of the footing.
- If the footing excavation does not extend into bedrock, the overexcavation shall extend a minimum of 5 feet below the bottom of the footing or to competent bedrock a minimum of 3 feet below the bottom of the footing, whichever is shallower. If bedrock is not encountered in the overexcavation, the overexcavation shall be a minimum of 12 feet wide centered on the footing.

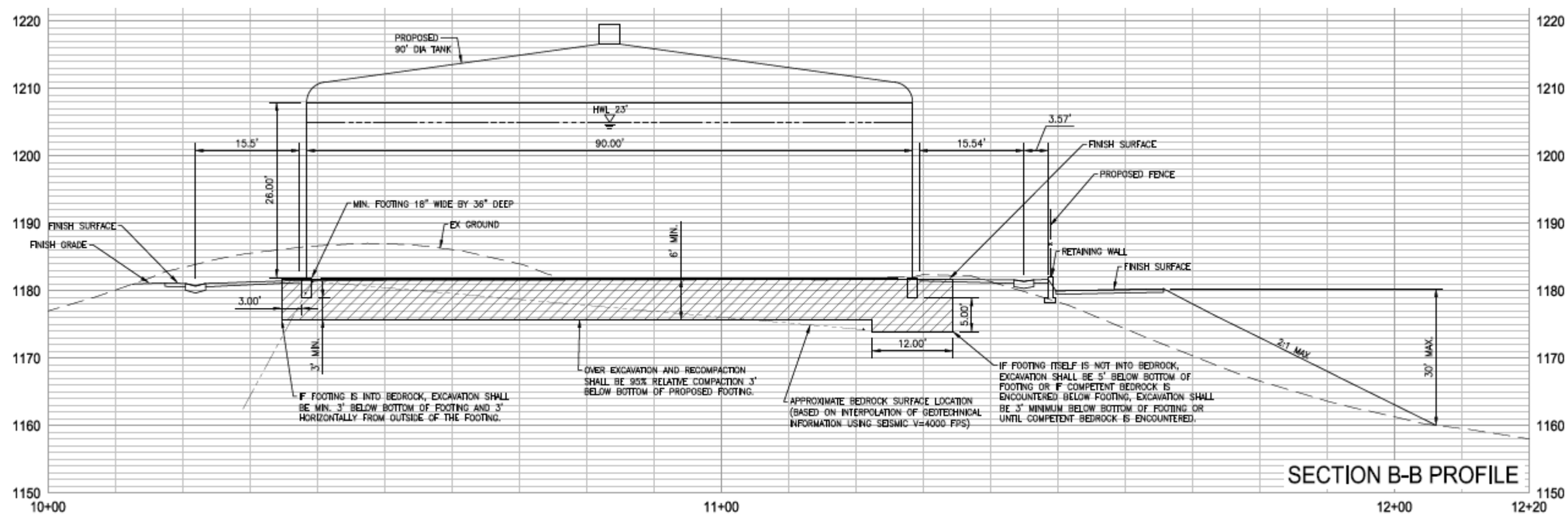
Diagrams showing the overexcavation recommendations relative to the existing ground surface and approximate bedrock surface based on field investigation data are shown in Figures No. 3a and 3b, *Proposed Surface vs. Bedrock Surface (Profiles)* following this page.

Overexcavations should extend at least 2 feet beyond wall footings and at least 1 foot beyond edge of the pavement. 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, excavations shall be deepened as needed to expose undisturbed, firm, and unyielding soils.




Note: Drawing adapted from profile drawings provided by Albert A Webb Associates on June 21, 2019.

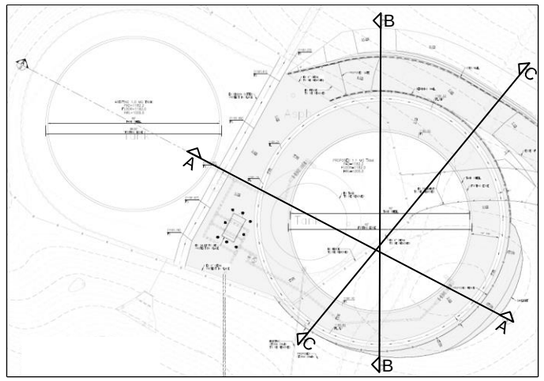
Project: New 1.1 MG Benedict Water Storage Tank
Location: City of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A Webb Associates

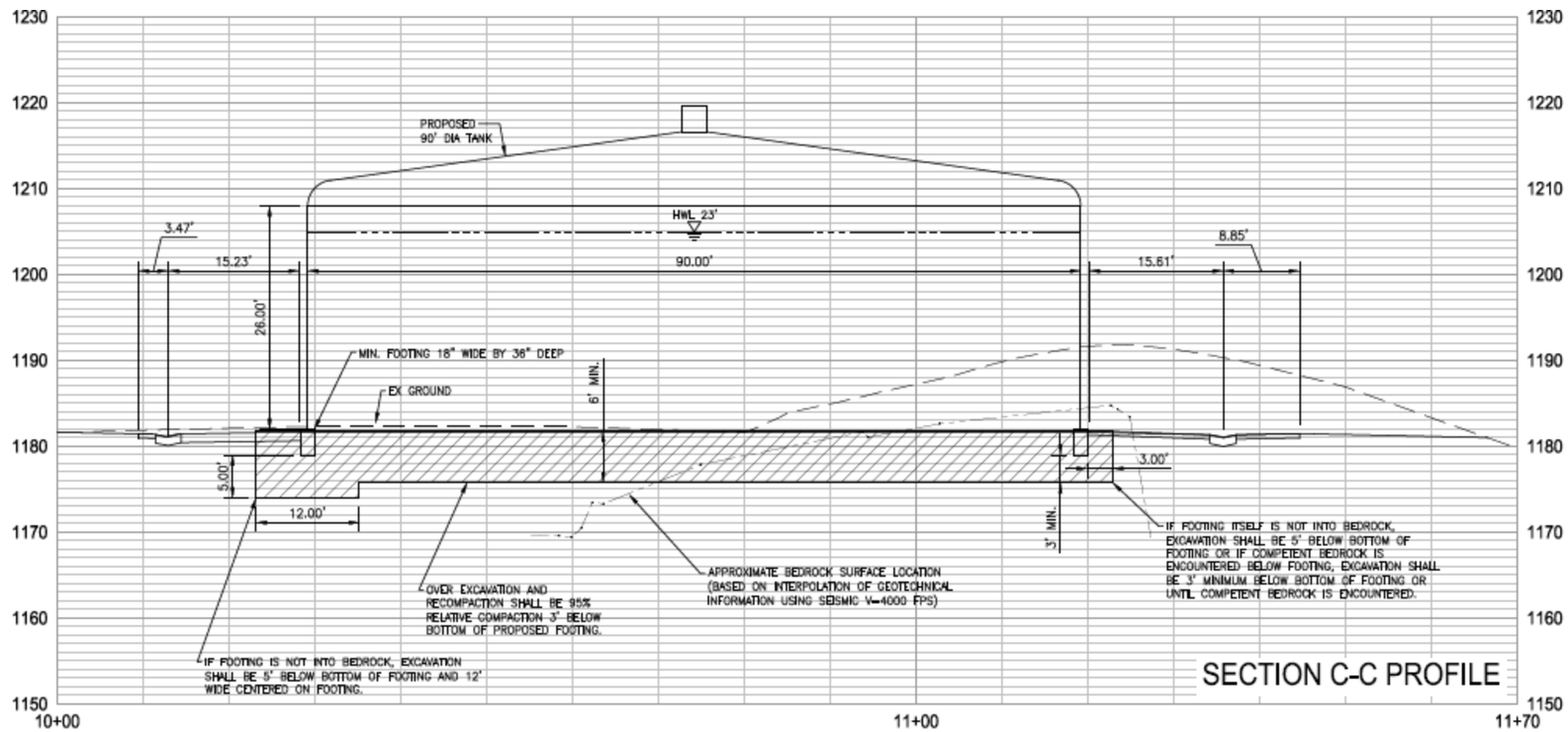
# Proposed Surface vs. Bedrock Surface (Profiles)

Project No
18-81-276-01

**Converse Consultants**

Figure No.
3a




Note: Drawing adapted from profile drawings provided by Albert A Webb Associates on June 21, 2019.

Project: New 1.1 MG Benedict Water Storage Tank
Location: City of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A Webb Associates

## Proposed Surface vs. Bedrock Surface (Profiles)

Project No
18-81-276-01

**Converse Consultants**

Figure No.
3b

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 aggregate 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 reuse as compacted fill. Excavated soils should be processed, including removal of roots and debris, removal of oversized particles (larger than 6 inches), 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 20 or less.
- Sand Equivalent greater than 15 (greater than 30 for pipe bedding).
- Contain less than 40 percent fines (passing #200 sieve).

Based on field investigation and laboratory testing results, on-site soils may be suitable as structural fill material but not as pipe bedding or pipe zone material.

Imported materials, if required, should meet the above criteria prior to being used as compacted fill. Any imported fills should be tested and approved by geotechnical representative prior to delivery to the site. Oversized particles (larger than 6 inches) can be blended and reuse as compacted fill.

### *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.

All fill placed below water tank pad and retaining wall footing should be compacted to at least 95 percent of the laboratory maximum dry density. All fill placed at the site other

than below water tank pad and retaining wall footing should be compacted to at least 90 percent of the laboratory maximum dry densities as determined by ASTM Standard D1557 test method, unless a higher compaction is specified herein.

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 compaction should be conducted in such a way within a horizontal distance of 5 feet from the wall so that any overstress will not transfer to 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.

### *9.6 Site Drainage*

Adequate positive drainage should be provided away from water 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 (if any).

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 JCSD Drawing No A-1, *Typical Trench Detail* (attached in Appendix C). Additional bedding recommendations 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 24 to 27. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. The pipe designer should determine if the soils are suitable as pipe bedding material.

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

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

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

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

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

iii. Bedding Materials must have less than 5 percent 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 do not satisfy, commercially available geofabric used for filtration purposes (such as Mirafi 140N or equivalent) may be wrapped around the bedding material encasing the pipe to separate the bedding material from the surrounding native or fill soils.

### 9.7.3 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 (larger than 6 inches) and deleterious matter may be used to backfill the trench zone. Trench backfill should follow the JCSD Drawing No A-1, *Typical Trench Detail* (attached in Appendix C). Additional trench backfill recommendations are presented below.

- 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 water 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.
- 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 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.

# 10.0 DESIGN RECOMMENDATIONS

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 tank and retaining wall 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. 5, 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 for water tank | 30 inches |
| Minimum continuous or isolated footing depth of embedment below lowest adjacent grade for retaining wall | 18 inches |
| Allowable net bearing capacity | 2,500 psf |

The footing dimensions and reinforcement should be based on structural design. The allowable bearing capacity can be increased by 500 pounds per square foot (psf) with each foot of additional embedment and 100 psf with each foot of additional width up to a maximum of 3,500 psf.

The allowable net bearing capacity is defined as the maximum allowable net bearing pressure on the ground. It is obtained by dividing the net ultimate bearing capacity by a safety factor. The ultimate bearing capacity is the bearing stress at which ground fails by shear or experiences a limiting amount of settlement at the foundation. The net ultimate bearing capacity is obtained by subtracting the total overburden pressure on a horizontal plane at the foundation level from the ultimate bearing capacity.

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 are presented in the following table.

**Table No. 6, Active and At-Rest Earth Pressures**

| Loading Conditions | Lateral Earth Pressure (psf/ft of depth) | |
|---|---|---|
| | Level Surface | 2:1 Backfill |
| Active earth conditions (wall is free to deflect at least 0.001 radian) | 42 | 82 |
| At-rest (wall is restrained) | 64 | 64 |

These pressures assume 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 240 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 2,500 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. An equivalent fluid seismic pressure of 25H 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 Slab-on-Grade*

Slab-on-grade should be supported on properly compacted fill. Compacted fill used to support slabs-on-grade should be placed and compacted in accordance with Section 9.4 *Compacted Fill Placement*.

Slab-on-grade should have a minimum thickness of 5 inches for support of nominal ground-floor live loads. Minimum reinforcement for slab-on-grade should be No. 5 reinforcing bars, spaced at 18-inches on-center each way. Structural design elements of slabs-on-grade, including but not limited to thickness, reinforcement, joint spacing of more heavily loaded slabs will be dependent upon the anticipated loading conditions and the modulus of subgrade reaction of the supporting materials and should be designed by a structural engineer.

Slabs should be designed and constructed as promulgated by the American Concrete Institute (ACI) and the Portland Cement Association (PCA). Care should be taken during concrete placement to avoid slabs curling. Prior to the slabs pour, all utility trenches should be properly backfilled and compacted.

Subgrade for slabs-on-grade should be firm and uniform. All loose or disturbed soils including under-slabs utility trench backfill should be recompacted.

In hot weather, the contractor should take appropriate curing precautions after placement of concrete to minimize cracking or curling of the slabs. The potential for slabs cracking may be lessened by the addition of fiber mesh to the concrete and/or control of the water/cement ratio (maximum 0.45).

Concrete should be cured by protecting it against loss of moisture and rapid temperature change for at least 7 days after placement. Moist curing, waterproof paper, white polyethylene sheeting, white liquid membrane compound, or a combination thereof may be used after finishing operations have been completed. The edges of concrete slabs exposed after removal of forms should be immediately protected to provide continuous curing.

## *10.4 Settlement*

Due to the presence of shallow bedrock within the tank area, and the overexcavation requirements and compaction criteria, 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 0.75 inches or less over a horizontal distance of 45 feet.

### *10.5 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. 7, *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 shutoffs should be installed to limit the potential leakage in the event of damage in a seismic event.

**Table No. 7, Soil Parameters for Pipe Design**

| Soil Parameters | Parameters |
|---|---|
| Total unit weight of compacted backfill (assuming 92% average relative compaction), $\gamma$ | 130 pcf |
| Angle of internal friction of soils, $\phi$ | 30º |
| Soil cohesion, c | 50 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/PVC pipe |
| Bearing pressure against Alluvial Soils | 2,000 psf |
| Coefficient of passive earth pressure, Kp | 3.0 |
| Coefficient of active earth pressure, Ka | 0.33 |
| Modulus of Soil Reaction, E’ | 1,500 psi |

### *10.6 Bearing Pressure for Anchor and Thrust Blocks*

An allowable net bearing pressure presented in Table No. 7, *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.

### *10.7 Soil Corrosivity*

One representative soil sample was 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 was 1,398 ohm-cm. This indicates that the tested soils are corrosive to ferrous metals in contact with the soil (Romanoff, 1957).

According to the Caltrans Corrosion Guidelines (Caltrans, 2018), soils are considered corrosive if the pH is 5.5 or less, or chloride content is 500 parts per million (ppm) or greater, or sulfate content is 1,500 ppm or greater, or resistivity less than 2,000 ohm-cm. Based on the tested results, the site soils are considered corrosive.

<u>Converse does not practice in the area of corrosion consulting. A qualified corrosion consultant should provide appropriate corrosion mitigation measures, for any ferrous metals in contact with the site soils.</u>

### *10.8 Asphalt Concrete Pavement*

Based on soil types, an R-value of 30 was assumed for the subgrade soils. For pavement design, we have utilized design Traffic Indices (TIs) ranging from 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.

**Table No. 8, Recommended Preliminary Pavement Sections**

| R-value | Traffic Index (TI) | Pavement Section | | |
|---|---|---|---|---|
| | | Option 1 | | Option 2 |
| | | Asphalt Concrete (inches) | Aggregate Base (inches) | Full AC Section (inches) |
| 30 | 5 | 3.0 | 6.0 | 6.0 |
| | 6 | 3.5 | 8.0 | 8.0 |
| | 7 | 4.0 | 10.0 | 10.0 |
| | 8 | 5.0 | 11.0 | 12.0 |

At or near the completion of site grading and trench backfill, the subgrade 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 Section 200-2.2,"*Crushed Aggregate Base*," of the current Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2018) and should be placed in accordance with Section 301-2 of the SSPWC.

Asphaltic concrete materials should conform Section 203 of the SSPWC and should be placed in accordance with Section 302-5 of the SSPWC.

## 11.0 CONSTRUCTION RECOMMENDATIONS

Temporary sloped excavation recommendations are presented in the following sections.

### *11.1 General*

Prior to the start of construction, the existing tank foundation should be demolished, and removed from the site. All existing underground utilities should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

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. 9, Slope Ratios for Temporary Excavations**

| Soil Type | OSHA Soil Type | Depth of Cut (feet) | Recommended Maximum Slope (Horizontal:Vertical)[1] |
|---|---|---|---|
| Silty Sand (SM) | C | 0-10 | 1.5:1 |
| | | 10-20 | 2:1 |
| Bedrock | A | 0-4 | vertical |
| | | 10-20 | 1:1 |

[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.

## 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 Albert A. Webb Associates 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 excavating test pits. During the site reconnaissance, the surface conditions were noted, and the test pits were marked in the field by reference to property boundaries, and other visible features. The test pit locations should be considered accurate only to the degree implied by the method used to mark them in the field.

Four test pits (PT-1 through PT-4) were excavated using a backhoe equipped with 24-inch wide bucket on May 10, 2019 to investigate subsurface conditions at the proposed site. The test pits were terminated at depths between 4.0 and 9.5 feet bgs due to refusal on bedrock.

Following the completion of logging and sampling, all test pits were backfilled with soil cuttings and wheel-rolled by the backhoe. If construction is delayed, the surface may settle over time. So, we recommend the owner monitor the test pit locations and backfill any depressions that might occur or provide protection around the test pit 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 test pits, refer to Drawing No. A-1, *Unified Soil Classification and Key to Test Pit Symbols*. Test Pits cross sections are presented in Drawings No. TP-1 through TP-4, *Test Pit Cross Sections.*

# SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| COARSE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS<br>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | CLEAN GRAVELS<br>(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<br>(APPRECIABLE AMOUNT OF FINES) | | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | | | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| | SAND AND SANDY SOILS<br>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | CLEAN SANDS<br>(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<br>(APPRECIABLE AMOUNT OF FINES) | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS<br>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)

CLASSIFICATION

| | |
|---|---|
| Plasticity | pi |
| Grain Size Analysis | ma |
| Passing No. 200 Sieve | wa |
| Sand Equivalent | se |
| Expansion Index | ei |
| Compaction Curve | max |
| Hydrometer | h |
| Disturb | Dist. |

STRENGTH

| | |
|---|---|
| Pocket Penetrometer | p |
| Direct Shear | ds |
| Direct Shear (single point) | ds* |
| Unconfined Compression | uc |
| Triaxial Compression | tx |
| Vane Shear | vs |
| Consolidation | c |
| Collapse Test | col |
| Resistance (R) Value | r |
| Chemical Analysis | ca |
| Electrical Resistivity | er |
| 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 TEST PIT SYMBOLS

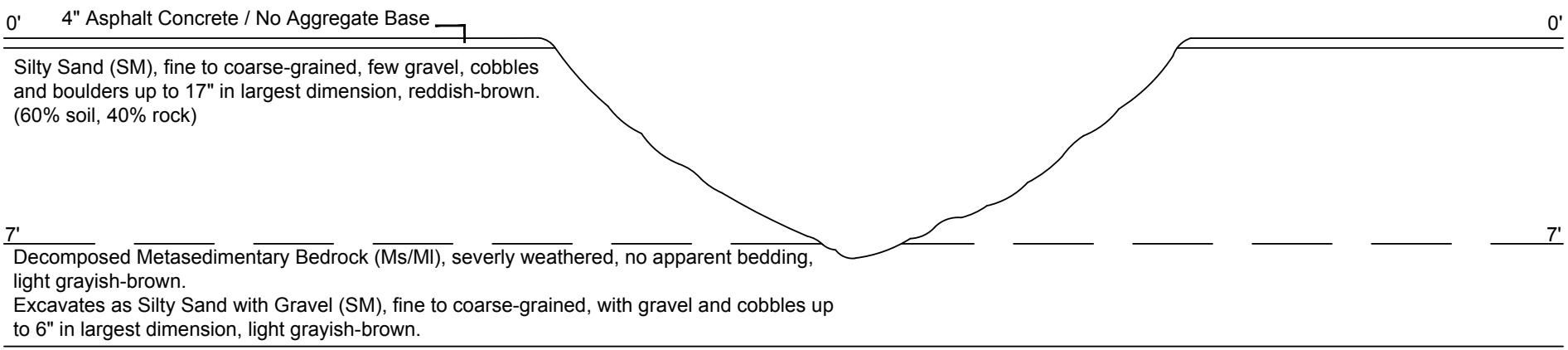
Converse Consultants

New 1.1 MG Benedict Water Storage Tank
City Of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

Project No.
**18-81-276-01**

Drawing No.
**A-1**

## TP-1




End of test pit @ 7.6' due to refusal on bedrock.
No groundwater encountered.
Backfilled with soil cuttings and tamped on 5/10/19.

**TP-1 CROSS SECTION**

Project: New 1.1 MG Benedict Water Storage Tank
Location: City of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

PROJECT NO. 18-81-276-01

5/10/19

DRAWING NO. TP-1

Converse Consultants

:\ACADDRAWINGS\18\81\276\18-81-276-01.DWG

## TP-2

0'

Silty Sand (SM), fine to coarse-grained, few gravel and cobbles up to 6" in largest dimension, reddish-brown.
(60% soil, 40% rock)

7'

Decomposed Metasedimentary Bedrock (Ms/Ml), severly weathered, no apparent bedding, light grayish brown.
Excavates as Silty Sand with Gravel (SM), fine to coarse-grained, few gravel and cobbles up to 6" in largest dimension, light grayish-brown.

0'

7'

End of test pit @ 9.5' due to refusal on bedrock.
No groundwater encountered.
Backfilled with soil cuttings and tamped on 5/10/19.

## TP-2 CROSS SECTION

Project: New 1.1 MG Benedict Water Storage Tank
Location: City of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

PROJECT NO.
18-81-276-01

5/10/19

DRAWING NO.
TP- 2

Converse Consultants

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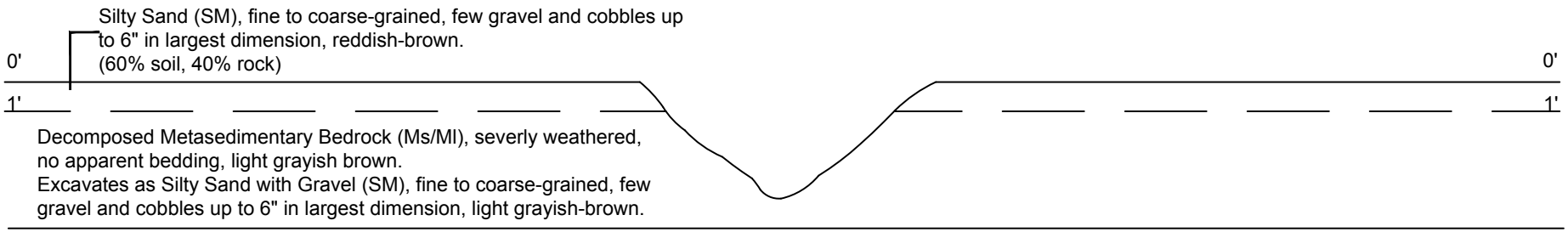
## TP-3




End of test pit @ 4' due to refusal on bedrock.
No groundwater encountered.
Backfilled with soil cuttings and tamped on 5/10/19.

**TP-3 CROSS SECTION**

Project: New 1.1 MG Benedict Water Storage Tank
Location: City of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

PROJECT NO. 18-81-276-01

5/10/19

DRAWING NO. TP- 3

Converse Consultants

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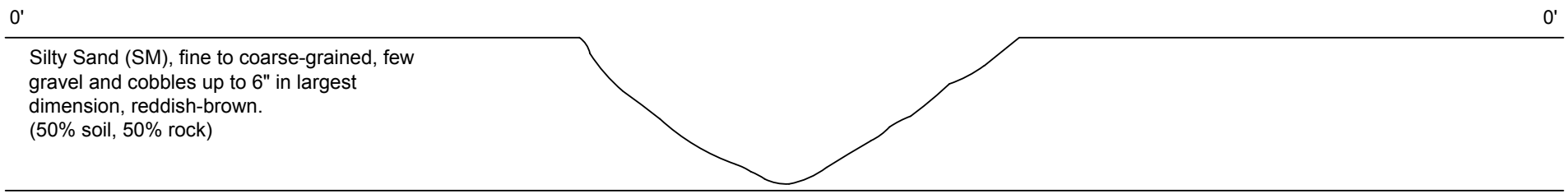
## TP-4 5/10/19




Silty Sand (SM), fine to coarse-grained, few gravel and cobbles up to 6" in largest dimension, reddish-brown.
(50% soil, 50% rock)

End of test pit @ 5' due to refusal on bedrock.
No groundwater encountered.
Backfilled with soil cuttings and tamped on 5/10/19.

## TP-4 CROSS SECTION

Project: New 1.1 MG Benedict Water Storage Tank
Location: City of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

PROJECT NO. 18-81-276-01

5/10/19

DRAWING NO. TP- 4

Converse Consultants

:\ACADDRAWINGS\18\81\276\18-81-276-01.DWG

# 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.

## Sand Equivalent

Two representative soil samples were tested in accordance with the ASTM D2419 test method to determine the sand equivalent. The test results are presented in the following table.

**Table No. B-1, Sand Equivalent Test Results**

| Test Pit No. | Depth (feet) | Soil Description | Sand Equivalent |
|---|---|---|---|
| TP-2 | 0-5 | Silty Sand (SM) | 24 |
| TP-4 | 0-5 | Silty Sand (SM) | 27 |

## Soil Corrosivity

One representative soil sample was tested by AP Engineering and Testing, Inc. (Pomona, CA) in accordance with California Tests 663, 622, and 617, to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of site soils when placed in contact with common construction materials such as concrete and steel. Test results are presented on the following table.

**Table No. B-2, Summary of Corrosivity Test Results**

| Test Pit No. | Depth (feet) | pH | Soluble Sulfates (CA 617) (percent by weight) | Soluble Chlorides (CA 622) (ppm) | Min. Resistivity (CA 663) (Ohm-cm) |
|---|---|---|---|---|---|
| TP-1 | 1-5 | 8.4 | 0.0133 | 40 | 1,398 |

## Grain-Size Analyses

To assist in classification of soils, mechanical grain-size analyses were performed on three select samples in accordance with the ASTM Standard D6913 test method.

Grain-size curves are shown in Drawing No. B-1, *Grain Size Distribution Results* and results are presented in the following table.

**Table No. B-3, Grain Size Distribution Test Results**

| Test Pit No. | Depth (ft) | Soil Classification | % Gravel | % Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|
| TP-1 | 1-5 | Silty Sand (SM) | 9.0 | 69.0 | 22.0 | |
| TP-3 | 0-4 | Silty Sand (SM) | 1.0 | 82.0 | 17.0 | |
| TP-4 | 0-5 | Sand with Silt (SP-SM) | 0.0 | 86.0 | 14.0 | |

## Maximum Dry Density and Optimum Moisture Content

Laboratory maximum dry density and optimum moisture content relationship tests were performed on two representative bulk soil samples. These tests were conducted in accordance with ASTM Standard D1557 method. Test results are presented on Drawing No. B-2, *Moisture-Density Relationship Results,* and summarized in the following table.

**Table No. B-4, Laboratory Maximum Density Test Results**

| Test Pit No. | Depth (feet) | Soil Description | Maximum Dry Density (pcf) | Optimum Moisture (%) |
|---|---|---|---|---|
| TP-2 | 0-5 | Silty Sand, Reddish Brown | 125.5 | 10.0 |
| TP-4 | 0-5 | Silty Sand, Reddish Brown | 127.0 (130.0*) | 9.5 (8.6*) |

(*Rock correction = 8.6%)

## Direct Shear

Two direct shear tests were performed on samples remolded to 90 percent of the laboratory maximum dry density in accordance with ASTM Standard D3080. Each test was conducted under soaked moisture condition. 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 and B-4*, Direct Shear Test Results,* and the following table.

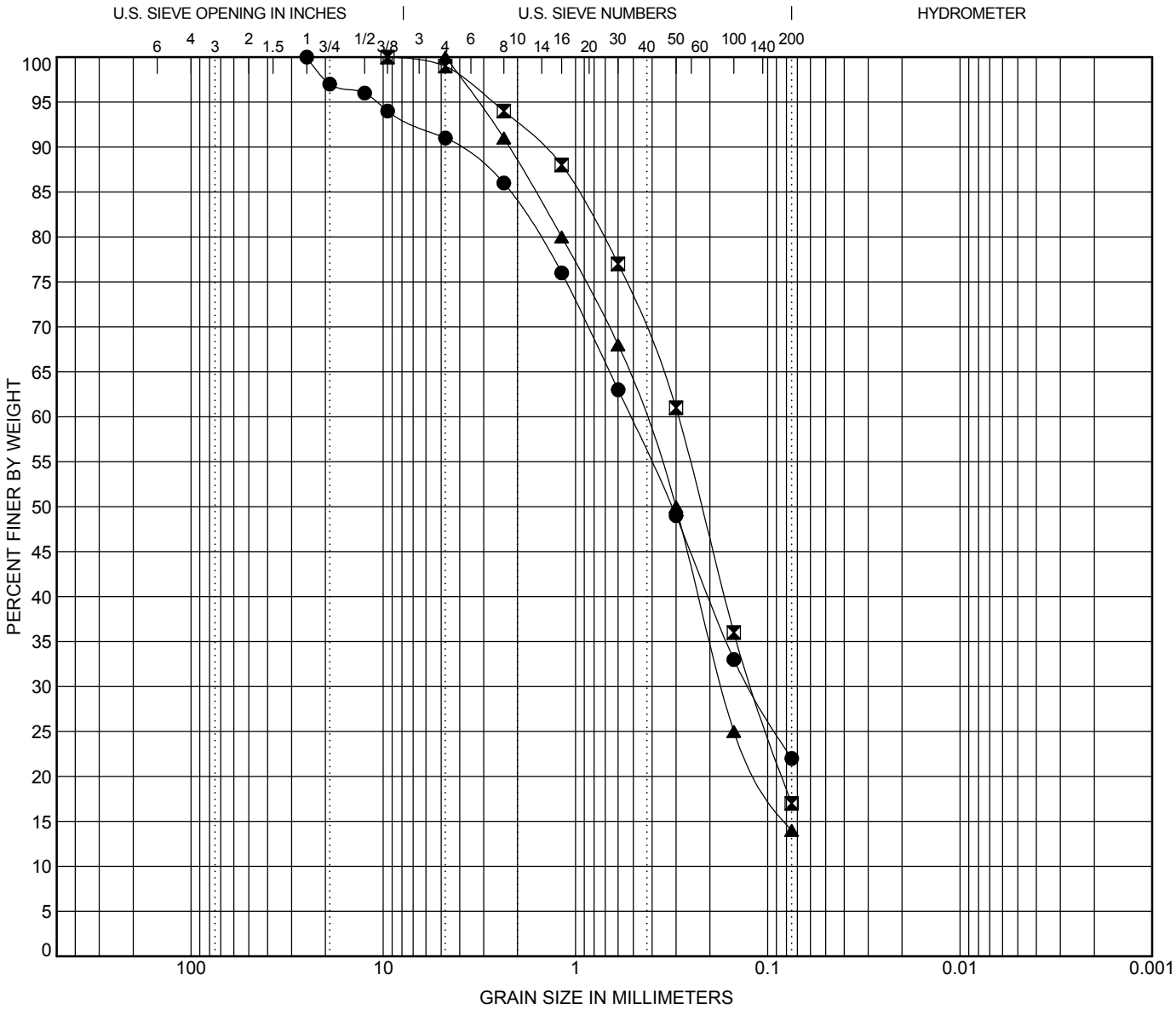
**Table No. B-5, Direct Shear Test Results**

| Test Pit No. | Depth (feet) | Soil Description | Ultimate Strength Parameters | |
|---|---|---|---|---|
| | | | Friction Angle (degrees) | Cohesion (psf) |
| *TP-2 | 0-5 | Silty Sand (SM) | 37 | 130 |
| *TP-3 | 0-4 | Silty Sand (SM) | 35 | 100 |

(*Sample remolded to 90% of the maximum dry density)

## Sample Storage

Soil samples currently stored in our laboratory will be discarded thirty days after the date of the final report, unless this office receives a specific request to retain the samples for a longer period.




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Boring No. | Depth (ft) | Description | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● | **TP-1** | **1-5** | **SILTY SAND (SM)** | | | | | |
| ⊠ | **TP-3** | **0-4** | **SILTY SAND (SM)** | | | | | |
| ▲ | **TP-4** | **0-5** | **SILTY SAND (SM)** | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| | Boring No. | Depth (ft) | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | **TP-1** | **1-5** | **25** | **0.517** | **0.124** | | **9.0** | **69.0** | **22.0** | |
| ⊠ | **TP-3** | **0-4** | **9.5** | **0.292** | **0.121** | | **1.0** | **82.0** | **17.0** | |
| ▲ | **TP-4** | **0-5** | **4.75** | **0.441** | **0.172** | | **0.0** | **86.0** | **14.0** | |
| | | | | | | | | | | |
| | | | | | | | | | | |

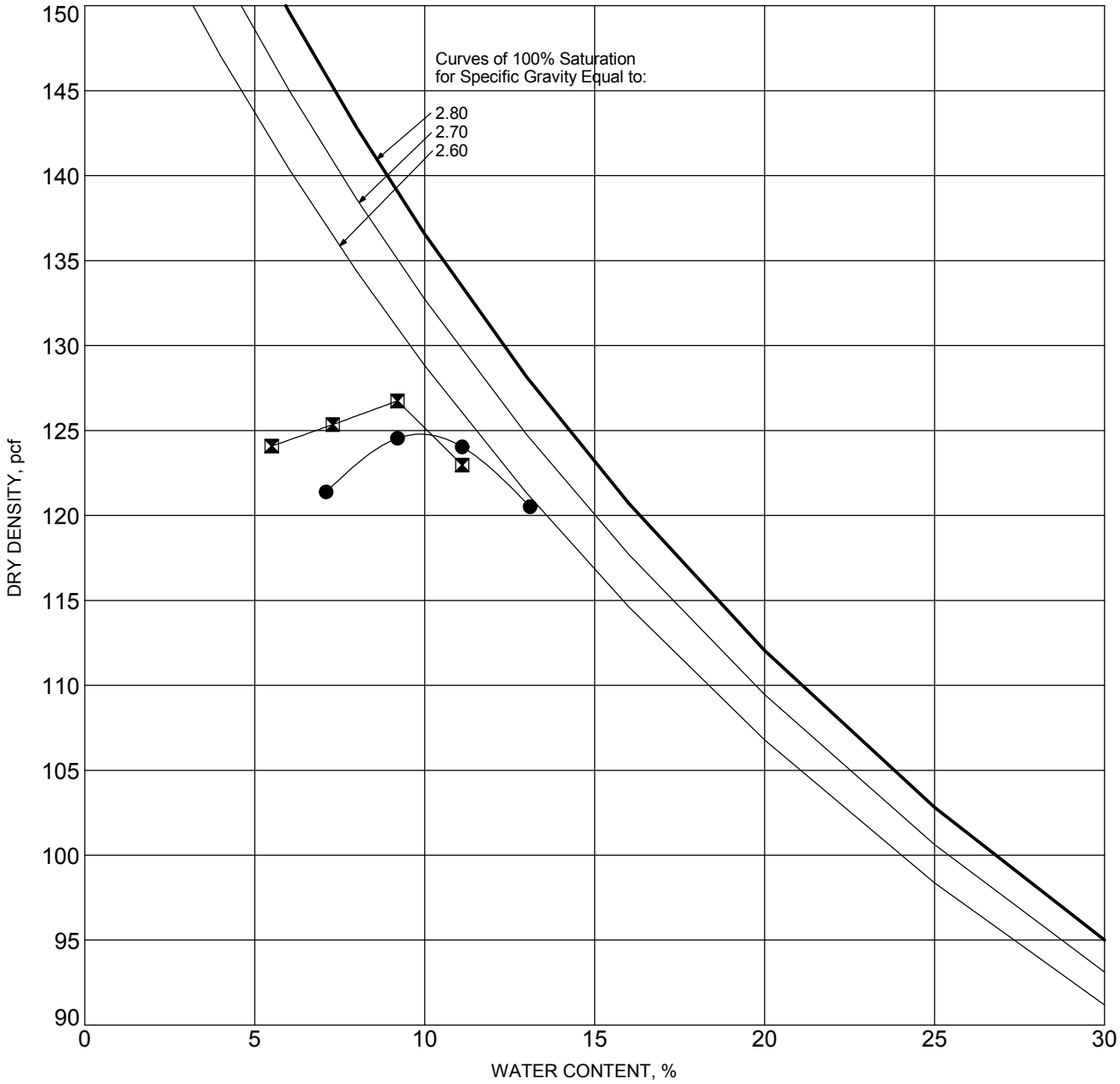
# GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

New 1.1 MG Benedict Water Storage Tank
City Of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

Project No. **18-81-276-01**

Drawing No. **B-1**




| SYMBOL | BORING NO. | DEPTH (ft) | DESCRIPTION | ASTM TEST METHOD | OPTIMUM WATER, % | MAXIMUM DRY DENSITY, pcf |
|---|---|---|---|---|---|---|
| ● | **TP-2** | **0-5** | **SILTY SAND (SM), REDDISH BROWN** | **D1557-A** | **10.0** | **125.5** |
| ⊠ | **TP-4** | **0-5** | **SILTY SAND (SM), REDDISH BROWN** | **D1557-A** | **9.5 (8.6*)** | **127.0 (130.0*)** |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**(*Rock correction = 8.6%)**

# MOISTURE-DENSITY RELATIONSHIP RESULTS

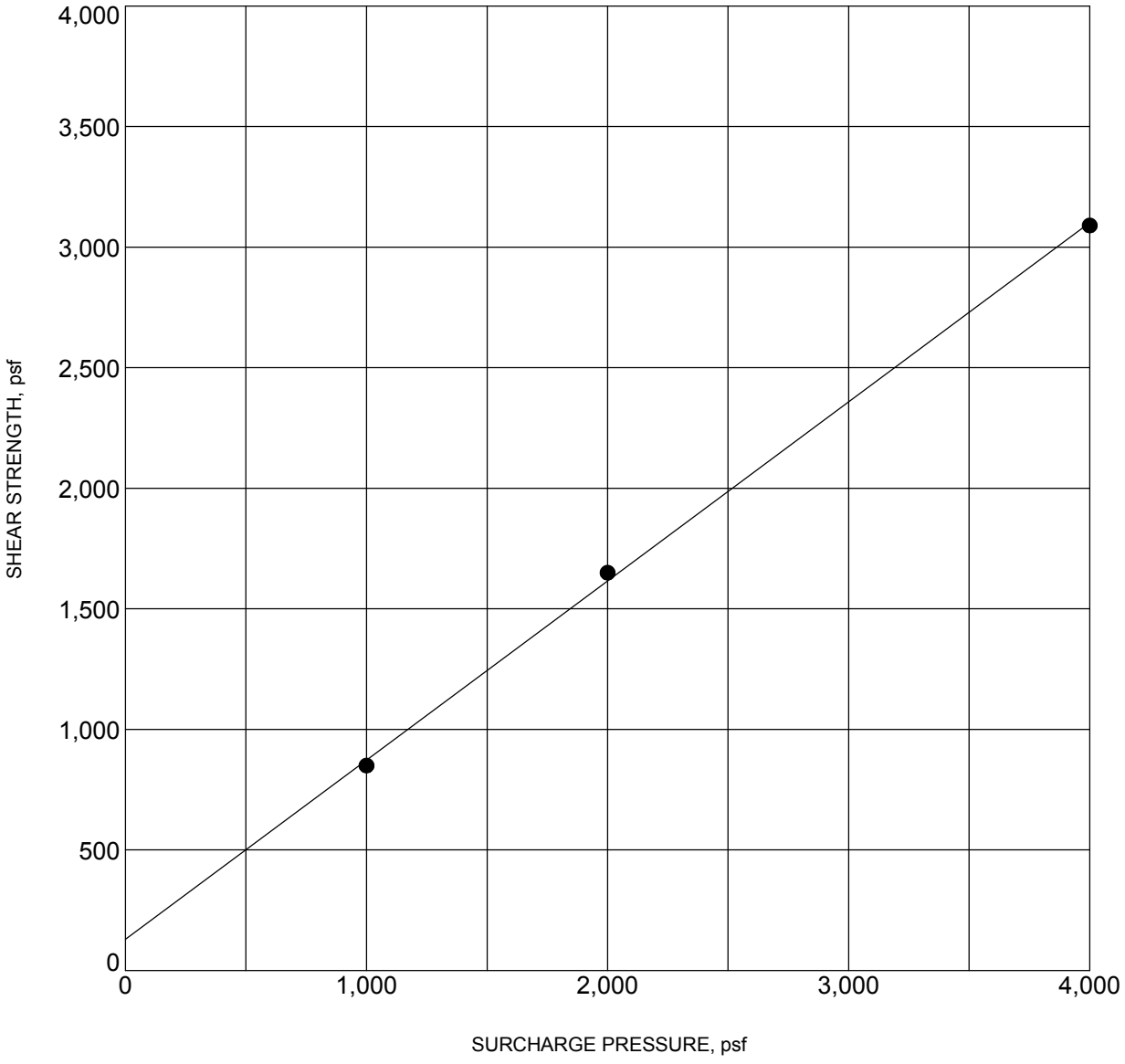
Converse Consultants

New 1.1 MG Benedict Water Storage Tank
City Of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

Project No.
**18-81-276-01**

Drawing No.
**B-2**

Project ID: 18-81-276-01.GPJ; Template: COMPACTION




| | | | |
|---|---|---|---|
| BORING NO. : | ***TP-2** | DEPTH (ft) : | **0-5** |
| DESCRIPTION : | **SILTY SAND (SM)** | | |
| COHESION (psf) : | **130** | FRICTION ANGLE (degrees): | **37** |
| MOISTURE CONTENT (%) : | **9.8** | DRY DENSITY (pcf) : | **110.4** |

**(*Sample remolded to 90% of the maximum dry density)**

NOTE: Ultimate Strength.

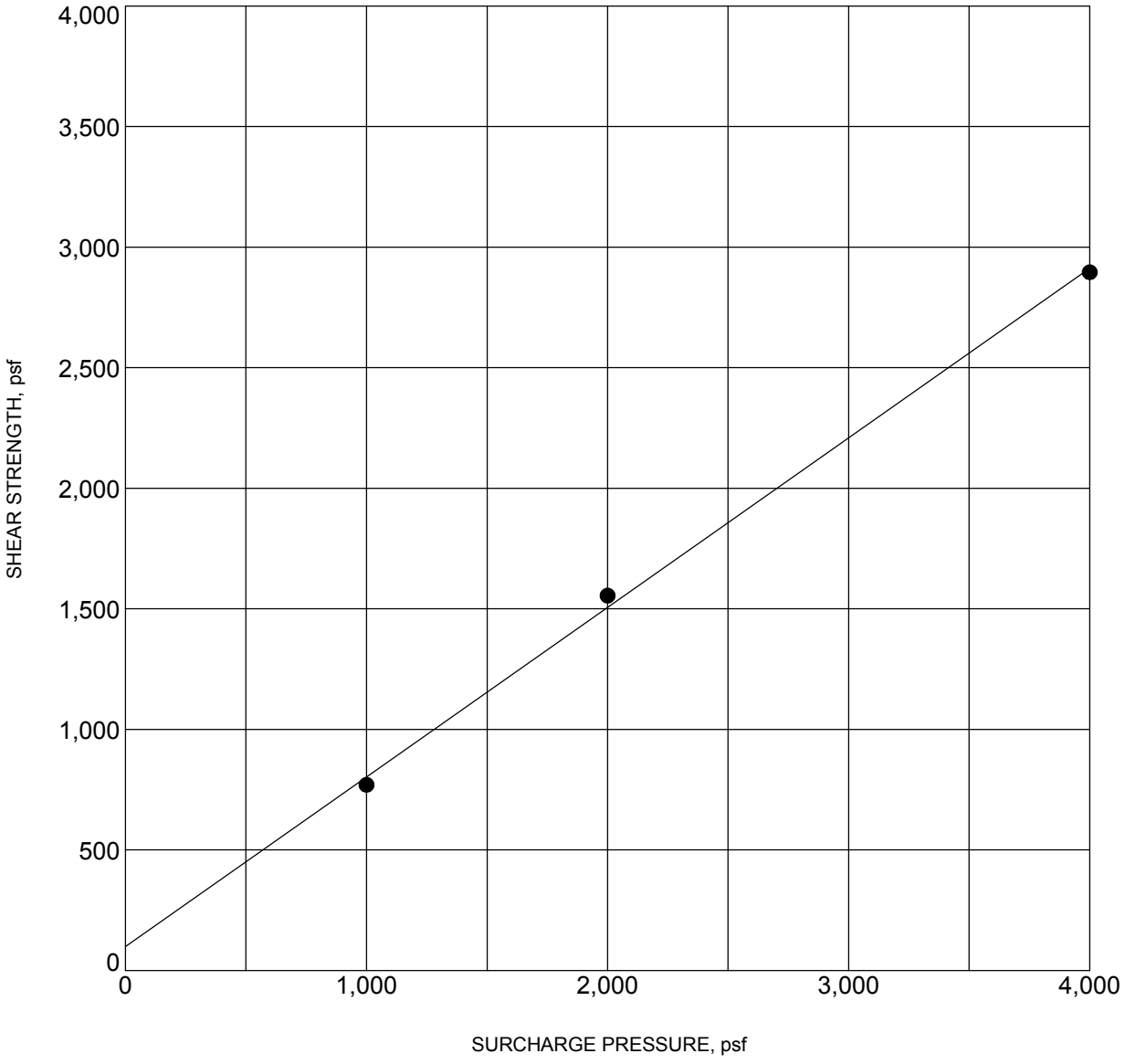
# DIRECT SHEAR TEST RESULTS

Converse Consultants

New 1.1 MG Benedict Water Storage Tank
City Of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

Project No. **18-81-276-01**

Drawing No. **B-3**




| | | | |
|---|---|---|---|
| BORING NO. : | ***TP-3** | DEPTH (ft) : | **0-4** |
| DESCRIPTION : | **SILTY SAND (SM)** | | |
| COHESION (psf) : | **100** | FRICTION ANGLE (degrees): | **35** |
| MOISTURE CONTENT (%) : | **9.3** | DRY DENSITY (pcf) : | **111.5** |

**(*Sample remolded to 90% of the maximum dry density)**

NOTE: Ultimate Strength.

# DIRECT SHEAR TEST RESULTS

Converse Consultants

New 1.1 MG Benedict Water Storage Tank
City Of Eastvale/Jurupa Valley, Riverside County, California
For: Albert A. Webb Associates

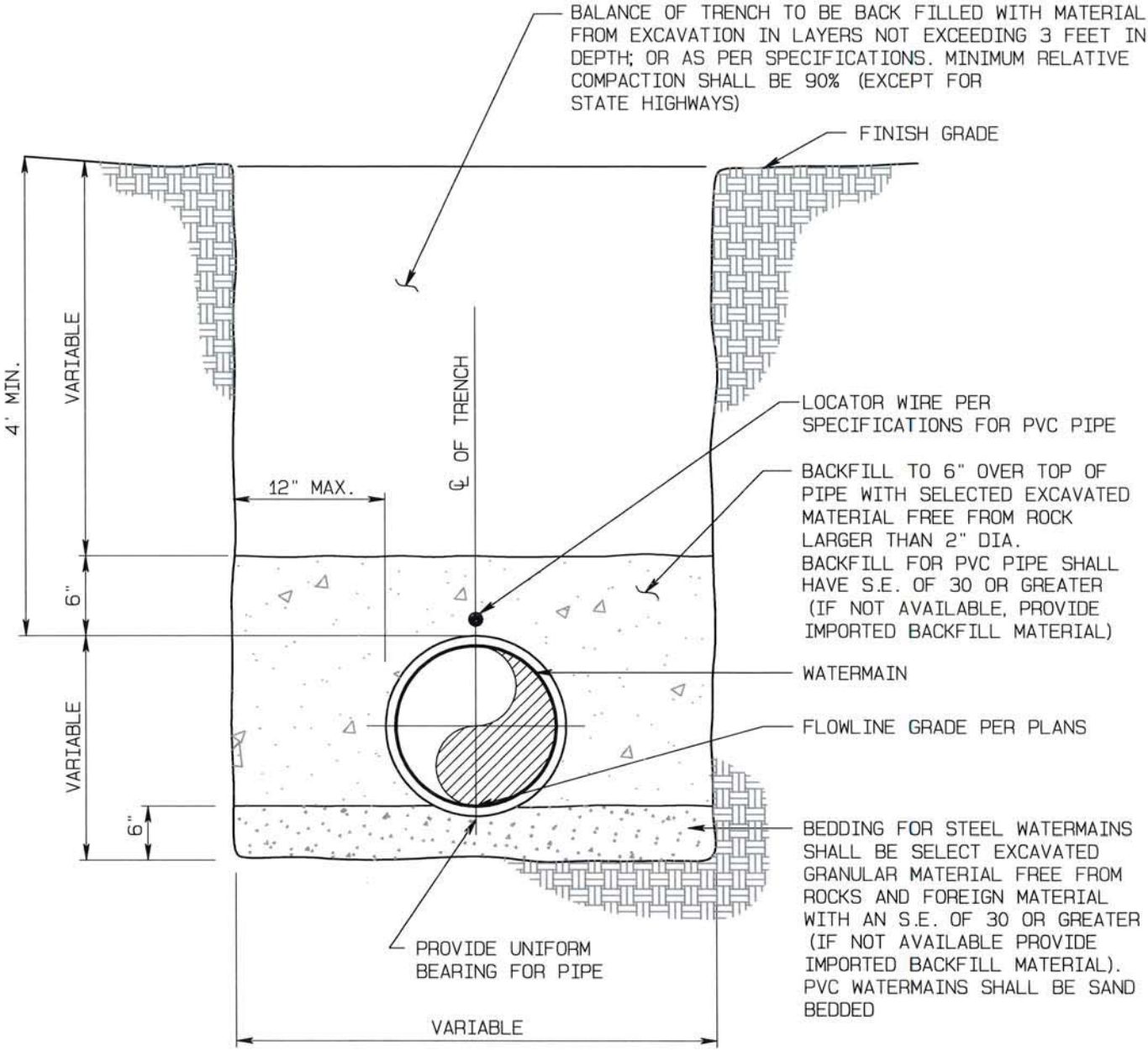
Project No. **18-81-276-01**

Drawing No. **B-4**

# Appendix C

## JCSD Pipe Bedding and Trench Backfill

06/06/2011




NOTES:

1. WHERE BOTTOM OF EXCAVATION IS IN ROCK WHICH CANNOT BE EXCAVATED TO PROVIDE UNIFORM BEARING FOR THE PIPE, OVEREXCAVATE 6" MINIMUM BELOW DESIGN GRADE, AND REFILL IN 3" THICK COMPACTED LAYERS WITH SELECTED EXCAVATED MATERIAL OR PROVIDE IMPORTED BACKFILL MATERIAL PER SPECIFICATIONS.

# JURUPA COMMUNITY SERVICES DISTRICT

| | | |
|---|---|---|
| SCALE: NONE | TYPICAL TRENCH DETAIL | DRAWING NO. |
| DATE: JUNE, 2011 | | A-1 |
| APPROVED BY: R.C.E. 26979 | ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA | W.O. 04-0358 |

REV.

# Appendix D

## Seismic Refraction Survey Report

# SEISMIC REFRACTION SURVEY
# NEW 1.1 MG BENEDICT WATER STORAGE TANK
# RIVERSIDE, CALIFORNIA

**PREPARED FOR:**
Converse Consultants
2021 Rancho Drive, Suite1
Redlands, CA 92373

**PREPARED BY:**
Southwest Geophysics, LLC
6280 Riverdale Street, Suite 200
San Diego, CA 92120

May 24, 2019
Project No. 119242

SOUTHWEST GEOPHYSICS LLC
YOUR SUBSURFACE SOLUTION

May 24, 2019
Project No. 119242

Mr. Jay Burnham
Converse Consultants
2021 Rancho Drive, Suite 1
Redlands, CA 92373

Subject: Seismic Refraction Survey
New 1.1 MG Benedict Water Storage Tank
Riverside, California

Dear Mr. Burnham:

In accordance with your authorization, we have performed a seismic refraction survey pertaining to the New 1.1 MG Benedict Water Storage Tank project located in Riverside, California. Specifically, our survey consisted of performing three seismic P-wave refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas surveyed, and to assess the apparent rippability of the subsurface materials. Our field services were conducted on May 3rd, 2019. This data report presents our survey methodology, equipment used, analysis, and results.

We appreciate the opportunity to be of service on this project. Should you have any questions please contact the undersigned at your convenience.

Sincerely,
**SOUTHWEST GEOPHYSICS, LLC**

Andrew Baird

Andrew S. Baird
Project Manager/Senior Staff Geophysicist

Hans van de Vrugt

Hans van de Vrugt, C.E.G., P.Gp.
Principal Geologist/Geophysicist

ASB/HV/hv

Distribution: Addressee (electronic)

REGISTERED GEOPHYSICIST
Hans van de Vrugt
No. 1012
Exp. 2/29/20
STATE OF CALIFORNIA

## TABLE OF CONTENTS

**Page**

## 1. INTRODUCTION

In accordance with your authorization, we have performed a seismic refraction survey pertaining to the New 1.1 MG Benedict Water Storage Tank project located in Riverside, California (Figure 1). Specifically, our survey consisted of performing three seismic P-wave refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas surveyed, and to assess the apparent rippability of the subsurface materials. Our field services were conducted on May 3rd, 2019. This data report presents our survey methodology, equipment used, analysis, and results.

## 2. SCOPE OF SERVICES

Our scope of services included:

- Performance of three seismic P-wave refraction lines at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results and conclusions.

## 3. SITE AND PROJECT DESCRIPTION

The project site is generally located east of the Quarry Oak Golf Club, and just north of a residential area in Riverside County, California (Figure 1). The study area was located primarily along established hiking trails. Vegetation consists of annual grass, brush and scattered trees, depending on location. Outcrops of granitic rock were observed throughout portions of the project area. Figures 2 and 3 depict the general site conditions in the area of the seismic traverses.

Based on our discussions with you, it is our understanding that your office is conducting a geotechnical evaluation pertaining to a new water tank construction project in the area. We also understand that the results from our survey may be used in the formulation of design and construction parameters for the project.

## 4. SURVEY METHODOLOGY

A seismic P-wave (compression wave) refraction survey was conducted at the project site to evaluate the rippability characteristics of the subsurface materials and to develop subsurface velocity profiles of the areas surveyed. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface vertical component 14-Hz geophones and recorded with a 24-channel Geometrics Geode seismograph. The travel times of the seismic P-waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

Three seismic lines (SL-1 through SL-3) were conducted in the study areas. The general locations and lengths of the lines were selected by your office. Shot points (signal generation locations) were conducted along the lines at the ends, midpoint, and intermediate points between the ends and the midpoint.

The seismic refraction theory requires that subsurface velocities increase with depth. A layer having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity, such as those caused by core stones, intrusions or boulders can also result in the misinterpretation of the subsurface conditions. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the spread.

In general, the seismic P-wave velocity of a material can be correlated to rippability (see Table 1 below), or to some degree "hardness." Table 1 is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2011) as well as our experience with similar materials, and assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock

characteristics, such as fracture spacing and orientation, play a significant role in determining rock quality or rippability. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

**Table 1 – Rippability Classification**

| Seismic P-wave Velocity | Rippability |
|---|---|
| 0 to 2,000 feet/second | Easy |
| 2,000 to 4,000 feet/second | Moderate |
| 4,000 to 5,500 feet/second | Difficult, Possible Blasting |
| 5,500 to 7,000 feet/second | Very Difficult, Probable Blasting |
| Greater than 7,000 feet/second | Blasting Generally Required |

It should be noted that the rippability cutoffs presented in Table 1 are slightly more conservative than those published in the Caterpillar Performance Handbook. Accordingly, the above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

## 5. DATA ANALYSIS

The collected data were processed using SIPwin (Rimrock Geophysics, 2003), a seismic interpretation program, and analyzed using SeisOpt Pro (Optim, 2008). SeisOpt Pro uses first arrival picks and elevation data to produce subsurface velocity models through a nonlinear optimization technique called adaptive simulated annealing. The resulting velocity model provides a tomography image of the estimated geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

## 6. RESULTS AND CONCLUSIONS

As previously indicated, three seismic traverses were conducted as part of our study. Figures 4a through 4c present the velocity models generated from our analysis. Based on the results it appears that the study areas are underlain by low velocity materials (i.e., topsoil, colluvium, etc.) in the near surface and granitic bedrock at depth. Distinct vertical and lateral velocity variations are

evident in the models. Moreover, the degree of bedrock weathering and the depth to bedrock appears to be highly variable across the study areas. In addition, remnant boulders appear to be present in the subsurface in some areas.

Based on the refraction results, variability in the excavatability (including depth of rippability) of the subsurface materials should be expected across the project area. A contractor with excavation experience in similar difficult conditions should be consulted for expert advice on excavation methodology, equipment and production rate.

## 7. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Southwest Geophysics, LLC should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

## 8. SELECTED REFERENCES

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Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

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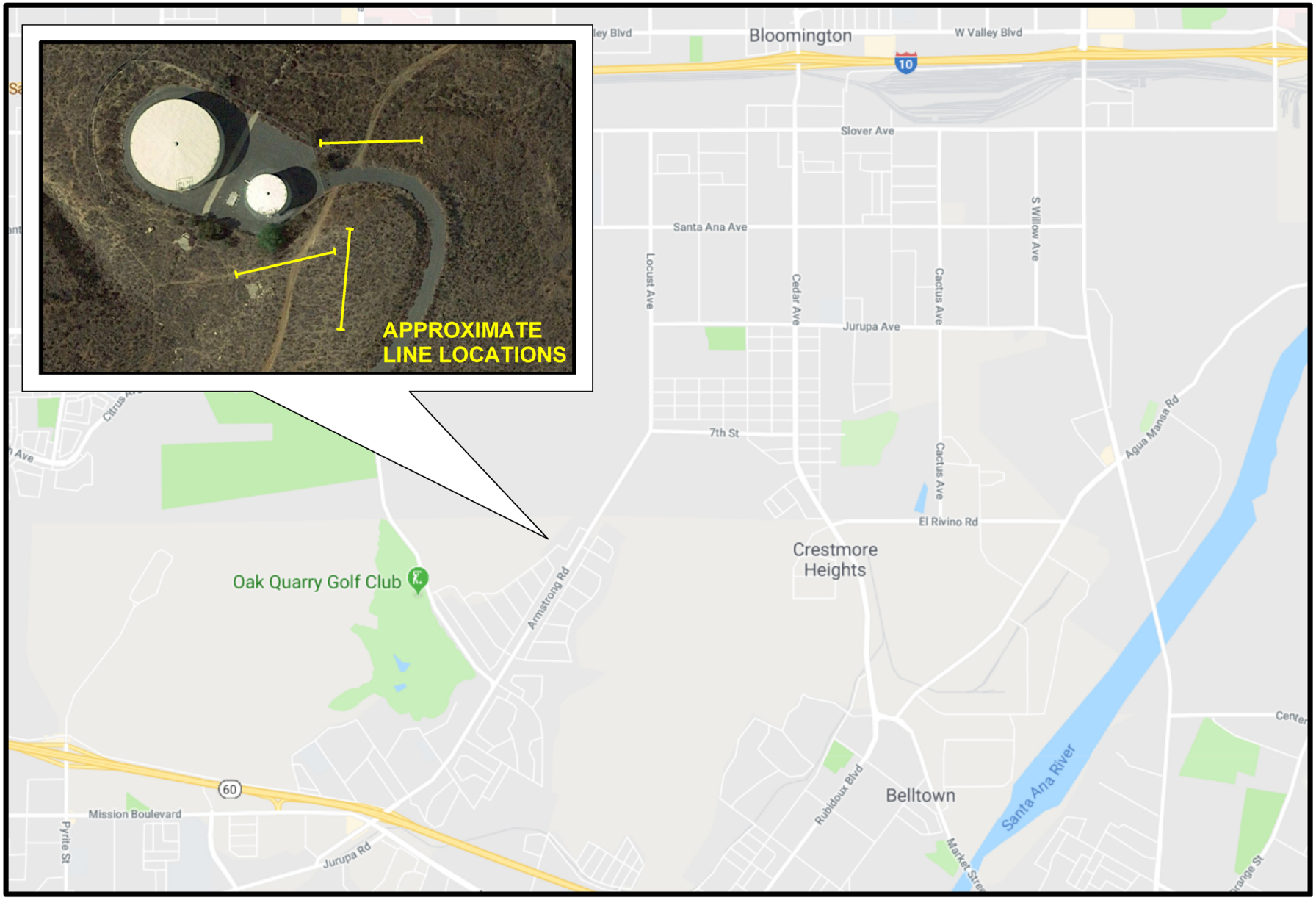



**SITE LOCATION MAP**

N

New 1.1 MG Benedict Water Storage Tank
Riverside, California

Project No.: 119242 | Date: 05/19

SOUTHWEST GEOPHYSICS LLC

Figure 1


**LINE LOCATION MAP**

N

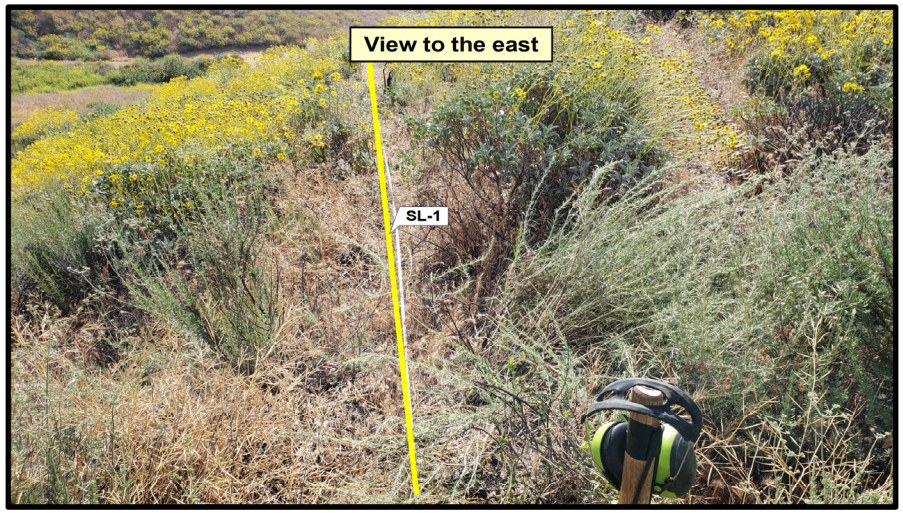
New 1.1 MG Benedict Water Storage Tank
Riverside, California

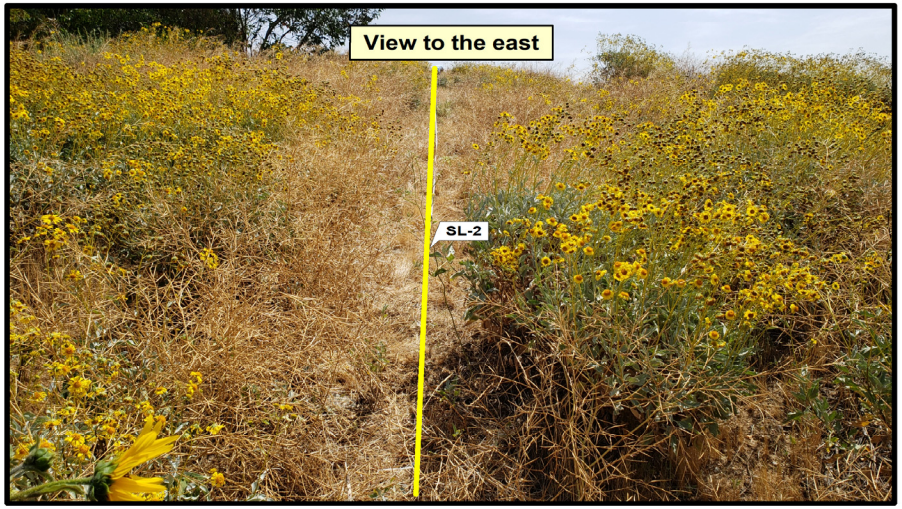
Project No.: 119242 | Date: 05/19

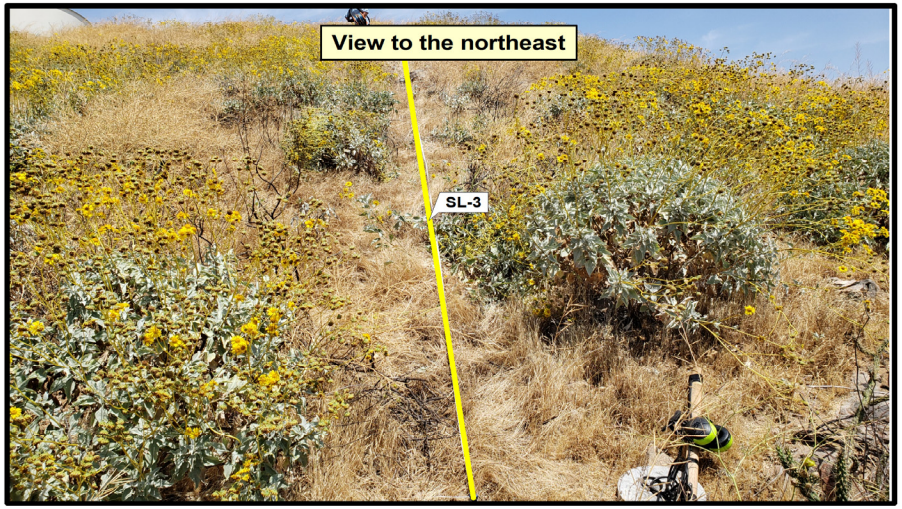
SOUTHWEST GEOPHYSICS LLC

Figure 2

0 150 300
approximate scale in feet

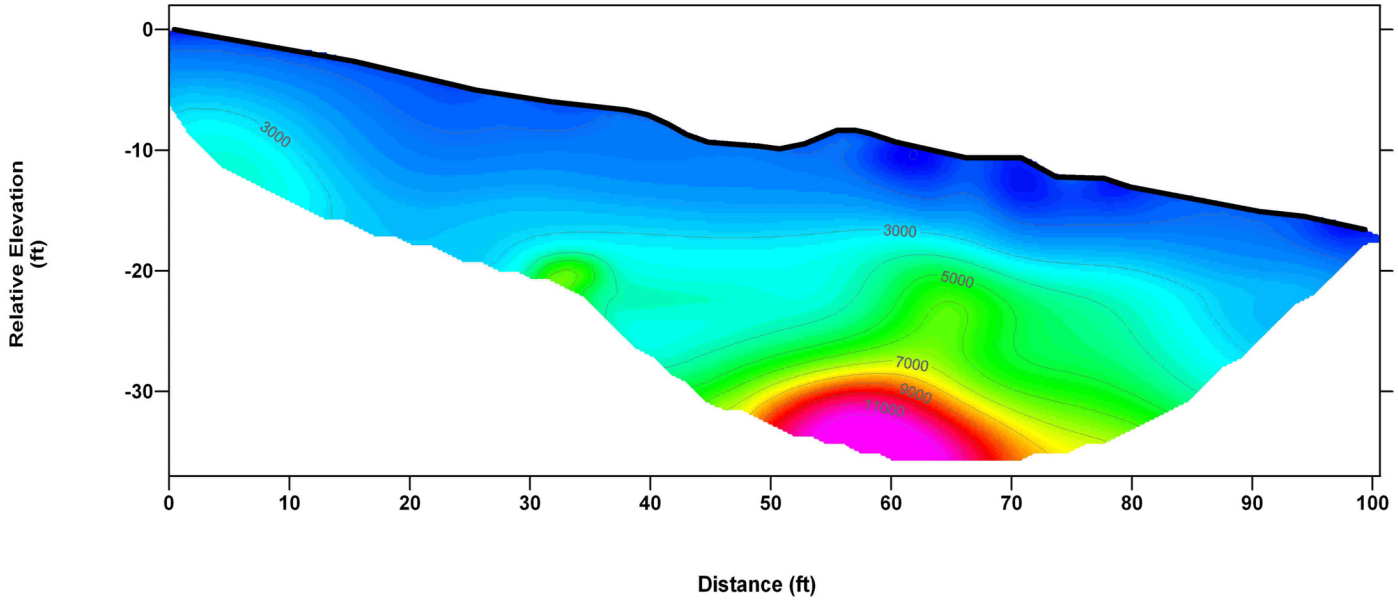


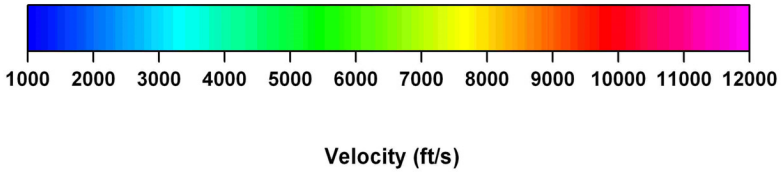




| | | |
|---|---|---|
| **SITE PHOTOGRAPHS** | New 1.1 MG Benedict Water Storage Tank<br>Riverside, California | SOUTHWEST GEOPHYSICS LLC<br>Figure 3 |
| | Project No.: 119242 / Date: 05/19 | |

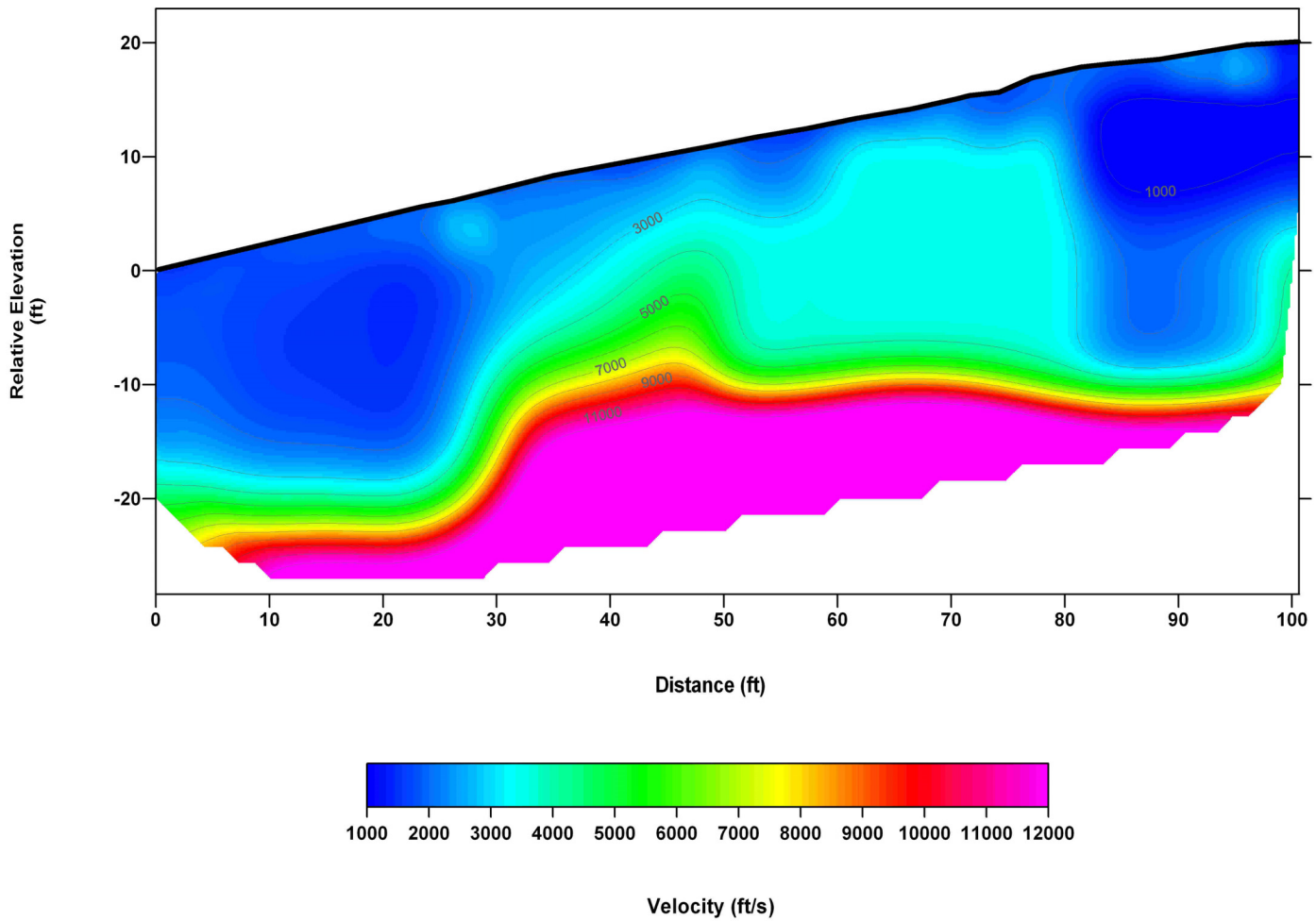
# TOMOGRAPHY MODEL




| | | | |
|---|---|---|---|
| **P-WAVE PROFILE SL-1** | New 1.1 MG Benedict Water Storage Tank<br>Riverside, California | SOUTHWEST GEOPHYSICS INC.<br>Figure 4a | **Note: Contour Interval = 1,000 feet per second** |
| | Project No.: 119242 / Date: 05/19 | | |

# TOMOGRAPHY MODEL




| | | | |
|---|---|---|---|
| **P-WAVE PROFILE SL-2** | New 1.1 MG Benedict Water Storage Tank<br>Riverside, California | SOUTHWEST GEOPHYSICS INC.<br>Figure 4b | **Note: Contour Interval = 1,000 feet per second** |
| | Project No.: 119242 / Date: 05/19 | | |

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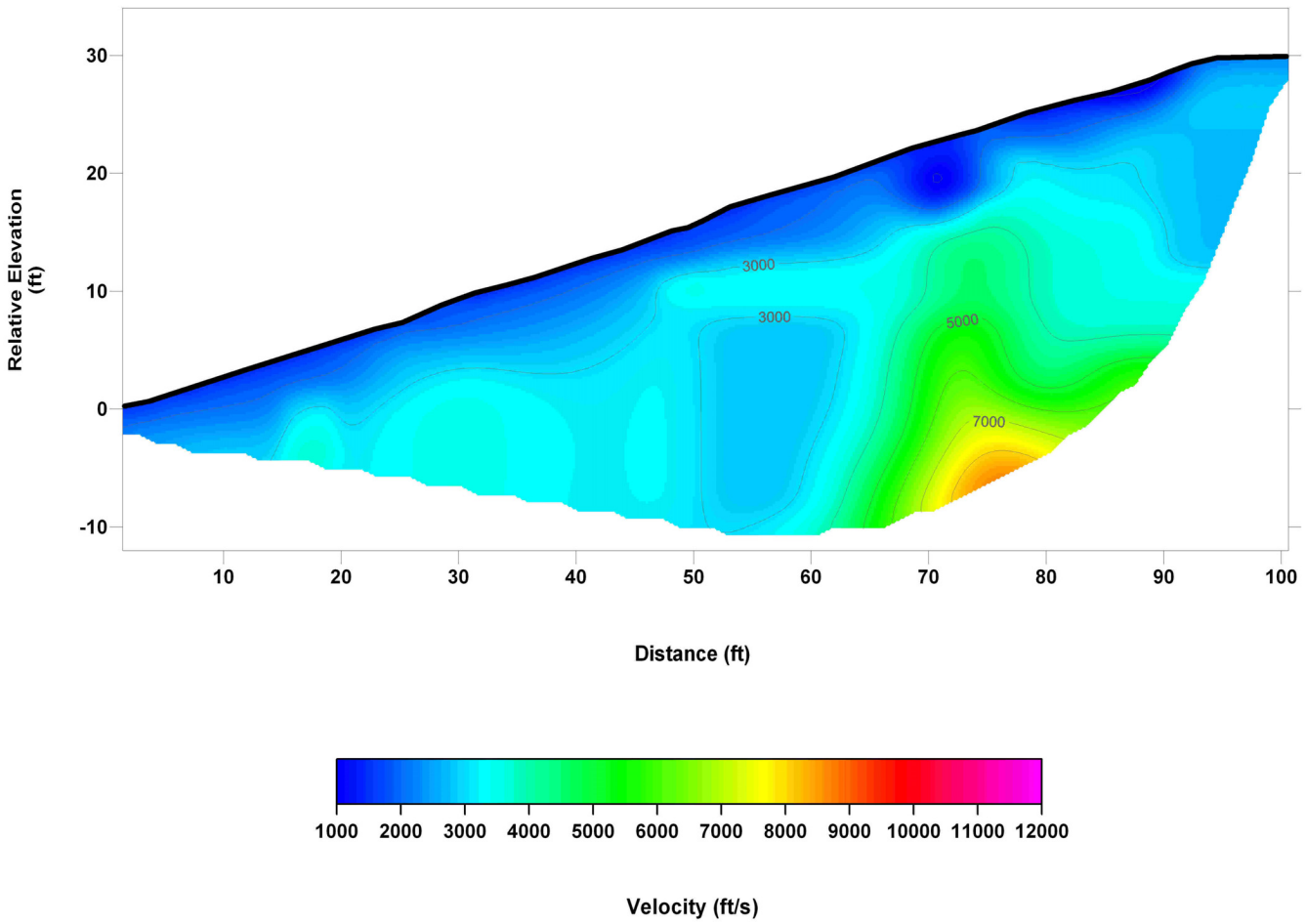


| | | | |
|---|---|---|---|
| **P-WAVE PROFILE SL-3** | New 1.1 MG Benedict Water Storage Tank<br>Riverside, California | SOUTHWEST GEOPHYSICS INC.<br>Figure 4c | **Note: Contour Interval = 1,000 feet per second** |
| | Project No.: 119242 / Date: 05/19 | | |