Initial Study and Mitigated Negative Declaration
Shadowbrook Lift Station and Force Main Project

March 2016

Lead Agency:

CITY OF
ROSEVILLE
CALIFORNIA

311 Vernon Street
Roseville, CA 95678

Prepared by:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2525 Warren Drive
Rocklin, CA 95677

NOTICE OF INTENT
TO ADOPT A MITIGATED NEGATIVE DECLARATION

for the

Shadowbrook Lift Station and Force Main Project — City of Roseville

Public Notice is hereby given that a Mitigated Negative Declaration (Environmental Report) is available for public review for the Shadowbrook Lift Station and Force Main project– City of Roseville.

Project Location: The Proposed Project site is located approximately 0.25 mile west of Interstate 80 within and adjacent to the Dry Creek Floodplain and west of the Shadowbrook Apartments, west of the Harding/Lead Hill Boulevard intersection, Roseville, Placer County, California.

Project Description: The Proposed Project would involve rehabilitation of the existing Shadowbrook Lift Station to improve its resiliency to sewer system overflows, which would reduce the potential for malfunctions to cause overflows, and also provide adequate time for operations and maintenance staff to respond to occasional high water alarms.

Document Review and Availability: The public review and comment period will extend for 30 days in accordance with CEQA Guidelines Section 15105 starting **March 25, 2016 and ending April 25, 2016**. The Initial Study/Mitigated Negative Declaration (IS/MND) is available for public review at the following location:

- City of Roseville Permit Center, 311 Vernon Street, Roseville, CA 95678 (8:00 A.M. to 5:00 P.M., Monday through Friday)

The IS/MND can also be viewed and/or downloaded at the City of Roseville website via the following: **http://www.roseville.ca.us/gov/development_services/planning/environmental_documents_n_public_notices.asp**

Comments/Questions: Comments and/or questions regarding the IS/MND may be directed to: Mark Morse, Roseville City Manager Office, 311 Vernon Street, Roseville, CA 95678 (916-774-5334).

Public Meetings: The City will be holding a Public Workshop to provide an overview of the project and accept comments on the IS/MND on March 31, 2016 from 5:30 PM to 7:00 PM at the City of Roseville Civic Center, Meeting Room 1.

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MITIGATED NEGATIVE DECLARATION

PROJECT TITLE: Shadowbrook Lift Station and Force Main project
PROJECT LOCATION: Approximately 0.25 mile west of Interstate 80 within and adjacent to the Dry Creek Floodplain and west of the Shadowbrook Apartments, west of the Harding/Lead Hill Boulevard intersection
DATE: March 25, 2016
PROJECT APPLICANT: City of Roseville
LEAD AGENCY: City of Roseville
CONTACT PERSON: Mark Morse, Environmental Coordinator: (916) 774-5334

PROJECT DESCRIPTION:

The Proposed Project would involve rehabilitation of the existing Shadowbrook Lift Station to improve its resiliency to sewer system overflows, which would reduce the potential for malfunctions to cause overflows, and also provide adequate time for operations and maintenance staff to respond to occasional high water alarms.

DECLARATION

The City of Roseville Environmental Coordinator has determined that the above project will have no significant effect on the environment and is therefore exempt from the requirement of an Environmental Impact Report (EIR). The determination is based on the attached initial study and the following findings:

a) *The project will not degrade environmental quality, substantially reduce habitat, cause a wildlife population to drop below self-sustaining levels, reduce the number or restrict the range of special-status species, or eliminate important examples of California history or prehistory.*

b) *The project does not have the potential to achieve short-term, to the disadvantage of long-term, environmental goals.*

c) *The project will not have impacts that are individually limited, but cumulatively considerable.*

d) *The project will not have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly.*

e) *No substantial evidence exists that the project will have a negative or adverse effect on the environment.*

f) *The project incorporates all applicable mitigation measures identified in the Initial Study.*

g) *This Mitigated Negative Declaration reflects the independent judgment of the lead agency.*

Written comments shall be submitted no later than **April 25, 2016**. City Council determination on this Mitigated Negative Declaration is final.

Submit comments to:

Mark Morse, Environmental Coordinator
City of Roseville, City Manager's Office
311 Vernon Street
Roseville, California 95678

Posting Period:

March 25, 2016 through April 25, 2016

Initial Study approved by:

Mark Morse, Environmental Coordinator

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

REPRESENTATIVE SITE PHOTOGRAPHS

SECTION 1. INTRODUCTION

1.1 Initial Study Purpose

This Initial Study has been prepared to identify and assess the anticipated environmental impacts of the proposed Shadowbrook Lift Station and Force Main project (Proposed Project). This document has been prepared to satisfy the California Environmental Quality Act (CEQA) (Pub. Res. Code, Section 21000 *et seq.*) And State CEQA Guidelines (14 CCR 15000 *et seq.*). CEQA requires that all state and local government agencies consider the environmental consequences of projects over which they have discretionary authority before acting on those projects. A CEQA Initial Study is generally used to determine which CEQA document is appropriate for a project (Negative Declaration [ND], Mitigated Negative Declaration [MND], or Environmental Impact Report [EIR]). The City of Roseville is the Lead Agency for this Initial Study.

1.2 Review Process

A project-level Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared for the Proposed Project. This IS/MND will be circulated for a 30-day public review and comment period as required by CEQA. During the review period, written comments may be submitted to:

Mr. Mark Morse
Environmental Coordinator
Roseville City Manager’s Office
311 Vernon Street
Roseville, CA 95678
mmorse@roseville.ca.us

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SECTION 2. PROJECT DESCRIPTION

2.1 Project Location

The Proposed Project site is located approximately 0.25 mile west of Interstate 80 within and adjacent to the Dry Creek Floodplain and west of the Shadowbrook Apartments, west of the Harding/Lead Hill Boulevard intersection, Roseville, Placer County, California, within the southeastern quarter of Section 35 of Township 11 North, Range 6 East, Mount Diablo Base and Meridian as depicted on the 1992 Roseville, CA USGS 7.5' topographic quadrangle map (**Figure 1.** ***Project Vicinity*** and **Figure 2.** ***Project Location***). It is also located within Assessor Parcel Numbers (APNs) 013-030-008, 013-030-009, 013-030-010, 015-130-016, 015-130-017, and 015-130-018 along both the west and east sides of Dry Creek.

2.2 Project Setting

The area of potential effect (APE) is approximately 4.5 acres. The area directly impacted by construction is approximately 4,000 square feet. The eastern portion of the site is located within the Shadowbrook Apartments complex, extending east to the intersection of Rocky Pointe and Shadow Ridge Roads (**Figure 3.** ***Surrounding Land Uses***). The existing Shadowbrook Lift Station is located on an irregularly shaped bench adjacent and west of the Shadowbrook Apartments complex between Shadow Ridge Road and Dry Creek. The center of the project site is characterized by mixed oak woodland and riparian vegetation communities, with Dry Creek transecting the project site adjacent to the Miners Ravine Class I Bike Trail. The project site extends northwest to East Street and west to Parry Street. A low-density residential development is located on the northwest side of East Street. See ***Representative Site Photos 1 through 8*** for views of the existing project setting.

The project site is located within an area zoned as Attached Housing (R3) and Floodway (FW) and is designated within the *City of Roseville General Plan Land Use Element* as High Density Residential (HDR) and Low Density Residential (LDR). Existing land uses that bound the project site (Figure 3) include Shadowbrook Apartment complex and Harding Boulevard to the east; Shadowbrook Apartment complex, high density residential development, and the Dry Creek Floodway to the south; William L. Taylor Park and low-density residential development to the west; and the Dry Creek Floodway to the north and low-density residential development to the northwest.

2.3 Background

The existing Shadowbrook Lift Station is located west and adjacent to the Shadowbrook Apartments, which were developed and constructed in two phases in 1981 and 1984. "As-built" plans prepared by JTS Engineering and dated September 1979 indicate that an approximate 370-foot long 6-inch sewer force main was constructed from the lift station site, and transected westerly across Dry Creek where it discharged into a 10-inch sewer line which was later replaced by a 63-inch sewer pipeline. The force main was re-connected to the 63-inch sewer pipeline at that time. The same plans depict a "proposed lift station" at the current Shadowbrook Lift Station site.

The plans also show a site development project area distinct from the location of the current lift station, suggesting that the subdivision changed ownership during the initial phases of its construction. Therefore, the original force main was either constructed in 1979 or possibly postponed until a different development was approved. The Shadowbrook site engineering plans dated September 1981

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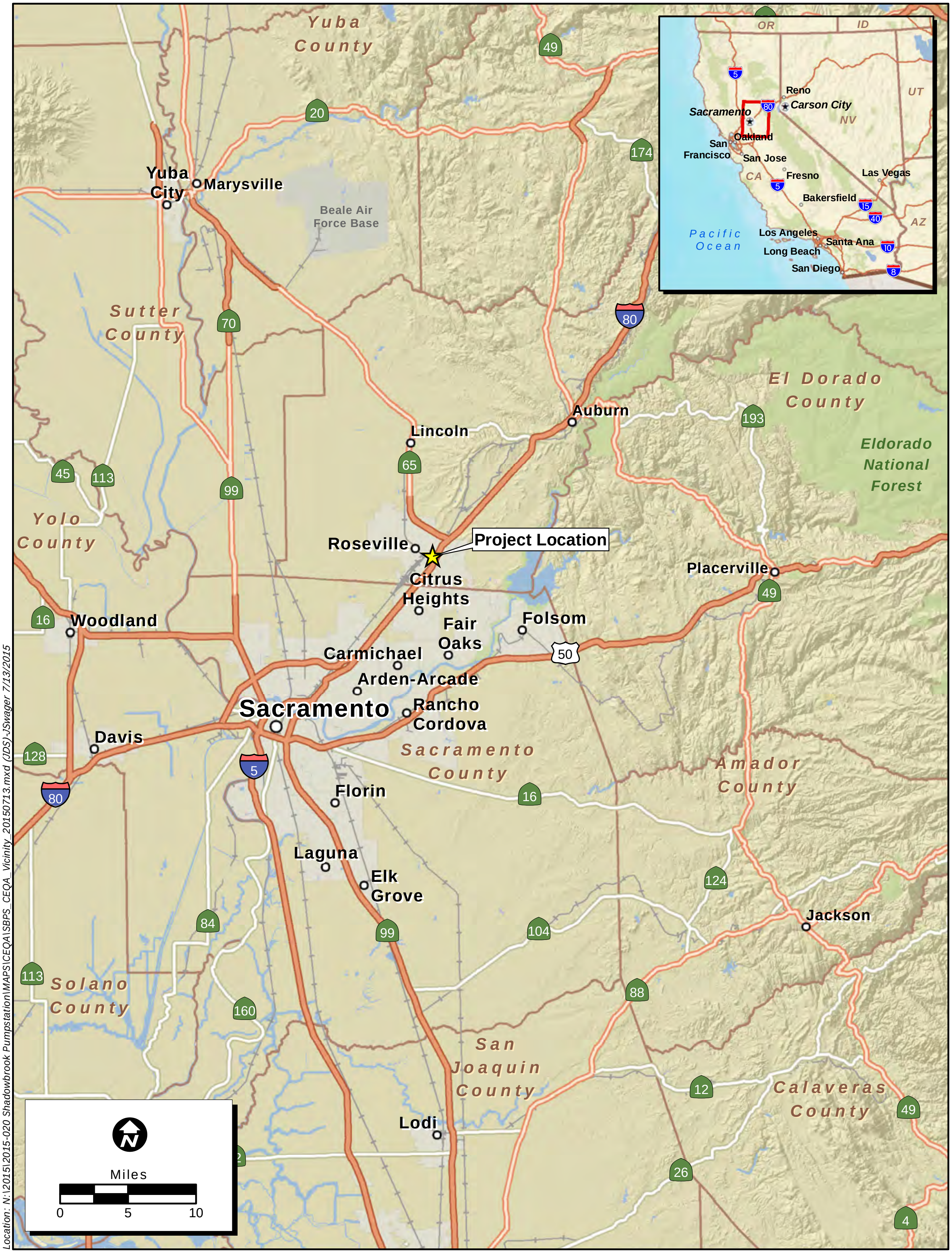

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\CEQA\SBPS_CEQA_Vicinity_20150713.mxd (JDS)-JSwager 7/13/2015

Map Date: 4/9/2013
Service Layer Credits: Sources: Esri, USGS, NOAA

Figure 1. Project Vicinity

2015-020 Shadowbrook Lift Station and Force Main Project

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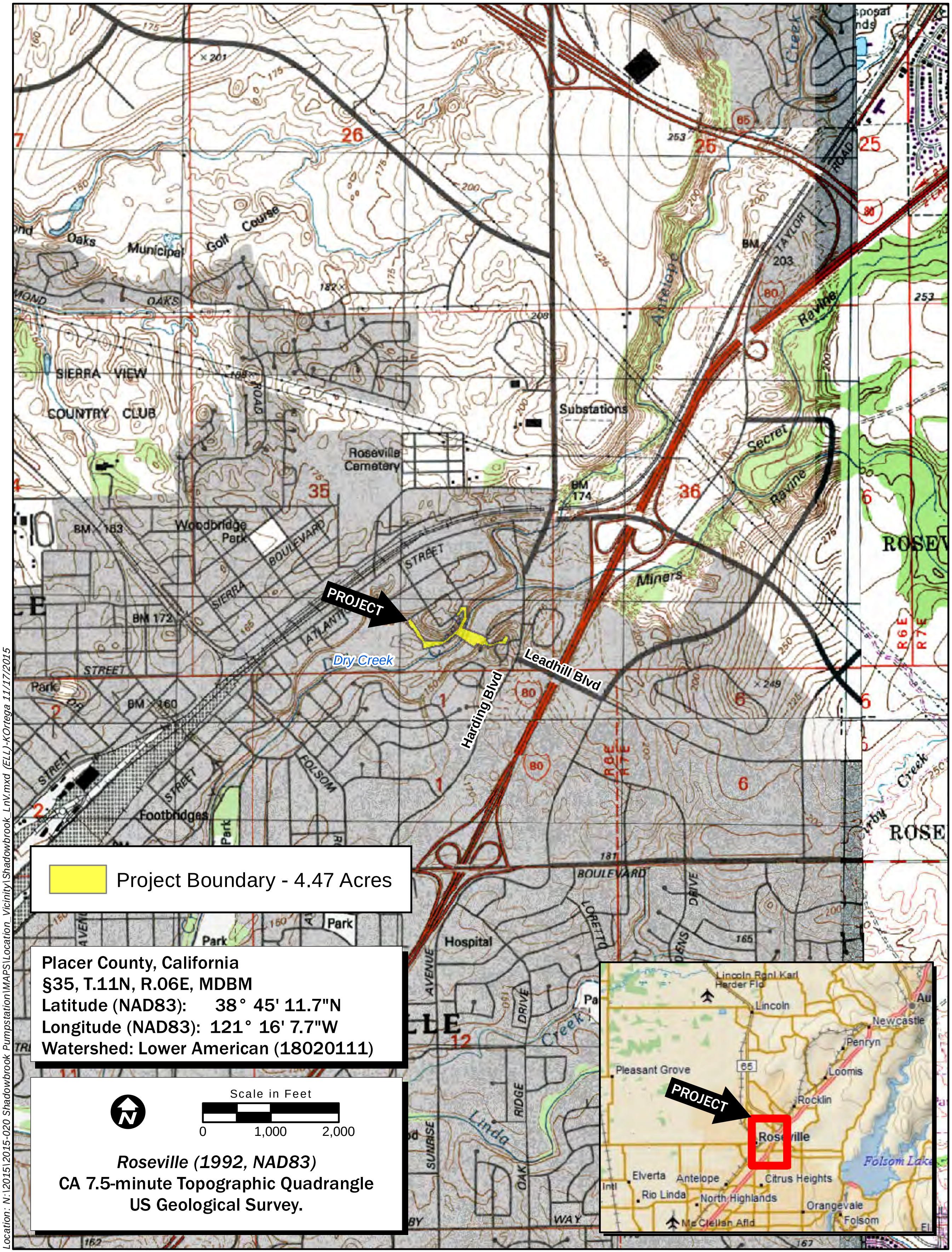

🟨 Project Boundary - 4.47 Acres

Placer County, California
§35, T.11N, R.06E, MDBM
Latitude (NAD83): 38° 45' 11.7"N
Longitude (NAD83): 121° 16' 7.7"W
Watershed: Lower American (18020111)

Roseville (1992, NAD83)
CA 7.5-minute Topographic Quadrangle
US Geological Survey.

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Location_Vicinity\Shadowbrook_LnV.mxd (ELL) -KOrtega 11/17/2015

Map Date: 11/17/2015
Service Layer Credits: Copyright:© 2013 DeLorme

Figure 2. Project Location

2015-020 Shadowbrook Pumpstation

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Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\CEQA\SBPS_CEQA_SurroundingLU_20151021.mxd (DEK)-KOrtega 2/19/2016

Map Date: 2/19/2016

[1] *Hatch Mott MacDonald; Photo Source: USGS 2013*

Scale in Feet
0 150

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Figure 3. Surrounding Land Uses

2015-020 Shadowbrook Lift Station and Force Main Project

Photo 1. View of Shadow Ridge and Harding Boulevard

Photo 2. View of Rocky Pointe and Shadow Ridge intersection within Shadowbrook Apartments complex and proposed equipment storage and parking area, view northeast.

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Representative Site Photographs

2015-020 Shadowbrook Lift Station and Force Main

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Photo 3. View of existing Shadowbrook lift station and pump control panel and electrical service building (the masonry enclosure on the left), view west.

Photo 4. View of pump control panel and electric service masonry enclosure, view east.

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Photo 5. View of Shadowbrook lift station, enclosure, and Shadowbrook Apartment complex, view northwest.

Photo 6. Overview of floodway between Shadowbrook lift station and Dry Creek, view north.

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Photo 7. Overview of Dry Creek, view northwest.

Photo 8. Overview of Miners Ravine Trail and proposed material laydown area, view north.

Representative Site Photographs

2015-020 Shadowbrook Lift Station and Force Main

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depict the sewage lift station as "existing," suggesting that perhaps it was constructed between completion of the force main in the late 1970s and the first phase Shadowbrook apartment complex site improvements in 1981.

The Shadowbrook Lift Station wet well configuration presented on the 1981 drawings coincides with the existing configuration on-site, consisting of a factory fabricated steel wet well and integral valve vault. However, the original lift station has been upgraded several times, including construction of a masonry security enclosure, reportedly constructed in the late 1990s, and replacement of the pump control panel and electrical service entrance switchgear depicted on plans dated February 26, 2008.

2.4 Project Objectives

The original components of the Shadowbrook Lift Station, primarily consisting of the wet well/valve vault structure and the force main, are more than 30 years old. The existing lift station is constructed at approximately two feet below the 100-year flood elevation risking inundation and possible lack of accessibility during a severe rainfall event. The lift station does have two electrical service feeds, but both are derived from a common Roseville Electric substation. The lift station is not equipped with a standby generator, instead requiring mobilization and connection of a portable generator during an electric utility outage.

The State of California Water Quality Control Board (SWQCB) has adopted a stringent policy regarding mitigation of sewer system overflows (SSOs). Therefore, the City of Roseville desires to upgrade the Shadowbrook Lift Station accordingly:

- replace the existing older components;
- improve the reliability and maintainability of the facility; and
- increase emergency storage capacity.

The Proposed Project would increase the sewage pumping system resiliency against overflows, which would reduce the potential for malfunctions to cause overflows, and also provide adequate time for operations and maintenance staff to respond to occasional high water alarms.

2.5 Project Characteristics

The Proposed Project would involve rehabilitation of the existing Shadowbrook Lift Station to improve its resiliency to sewer system overflows. The Proposed Project would involve installation of a new fiberglass wet well within the existing pump station steel wet well, thereby occupying the same footprint. To increase capacity, the new wet well top elevation would extend 3.7 feet above the existing wet well to a point 1.7 feet above the 100-year Floodplain elevation. The existing masonry enclosure surrounding the pump station would be partially reconfigured to raise the concrete working pad to match the new top of wet well elevation and the existing lift station masonry block walls would also be extended vertically to retain the present 8 foot distance above grade. The footprint for the concrete pad would also be extended to provide a secured area for a permanently mounted on-site standby generator. The expansion area would be immediately adjacent to the existing lift station facility and overlay an area which is currently occupied by a concrete pad. The reconstructed lift station would cover an area of approximately 4,000 square feet which is approximately 2,100 square feet larger than the existing facility.

Additionally, the Proposed Project would include installation of new dual 6-inch force mains to connect from the lift station to the existing 63-inch Dry Creek Interceptor sewer line located on the west side of the creek. The purpose for the second force main is to provide system redundancy rather than capacity for future sewage flows (sewer shed is built out). The new dual force mains would be approximately 370 feet in length and would consist of ductile iron pipe with ceramic epoxy lining.

Geotechnical evaluations were undertaken between the existing lift station and the Dry Creek Interceptor to define subsurface conditions and assess the feasibility of alternative force main construction methods. An evaluation of trenching construction methods resulted in the recommendation that less risky and costly open cut excavation trenching and backfill be required for the construction of the replacement force mains. This was due in large measure to the discovery of shallow volcanic breccia, ranging between three and six feet below the ground surface at Dry Creek and continuing at relatively shallow depths between the creek and the Dry Creek interceptor force main tie-in point to the west. Therefore the force mains would be installed by cut and cover (open trenching) methods between the pump station on the east side of the creek and the Dry Creek Interceptor manhole on the west side of the creek. The trench depth would range between 5 to 12 feet. Trench depths in excess of 5 feet would require shoring. With use of shoring, the trench width would be approximately 3 to 5 feet. A combination of native soil, sand, gravel, crushed rock and low strength concrete would be used to backfill the trench following pipe installation. Construction methods in the creek are described in more detail below (**Figure 4.** *Site Plan*). **Figure 5.** *Area of Disturbance* shows the proposed ground disturbance footprint, as well as, trees designated for removal. A profile of the trench in relation to surface elevation and the location of bedrock is provided in **Figure 6.** *Trenching Profile*.

Proposed Pumping System

The firm capacity provided by the existing pumps exceeds the projected peak wet weather flow (PWWF) projected for the Shadowbrook Lift Station. Therefore replacement of the existing pumps with new units of the same size and keeping the existing pumps as un-installed backups is appropriate. The new pumps would be equipped with standard submersible pump mounting hardware (four-inch discharge connection/elbow, two-inch guide rails and brackets).

Additional accessories could include chain, cable holder, submersible cables, and pump motor moisture and thermal monitoring equipment.

Emergency Storage

Section 9 of the City of Roseville Design Standards prescribes the steps and calculations for projecting future wastewater flows to be used in the design of sewerage infrastructure within the City. The City has established flow estimating criteria for projecting average dry weather flow (ADWF), Factored ADWF, and peak wet weather flow (PWWF) for proposed projects. In addition to sizing of the pumps and force mains for a lift station, the flow estimating criteria can be used to size lift station emergency storage. The City installed flow metering equipment in November 2014, and March/April 2015 to confirm the magnitude of the average daily flows tributary to the station (40± gpm). The lift station does not have a history of overflows.

It has been determined by the City Environmental Utilities (EU) that provision of four hours of emergency sewage storage at ADWF (1,300 cubic feet) is appropriate. In order to meet this requirement, a 60-inch diameter by 66-foot long pipe would be installed in the existing driveway north of the lift station. An 8-inch diameter fill/drain pipe installed at a slope of 0.5 percent would connect the emergency storage to the existing sewer system. The emergency storage pipe would be located within the existing easement surrounding the lift station.

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\CEQA\SBPS_CEQA_SitePlan_20160224.mxd *(DEK)-JSwager 2/24/2016*

Map Date: 2/24/2016

[1] Hatch Mott MacDonald; Photo Source: USGS 2013

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Figure 4. Shadowbrook Lift Station & Force Main Site Plan

2015-020 Shadowbrook Lift Station and Force Main Project

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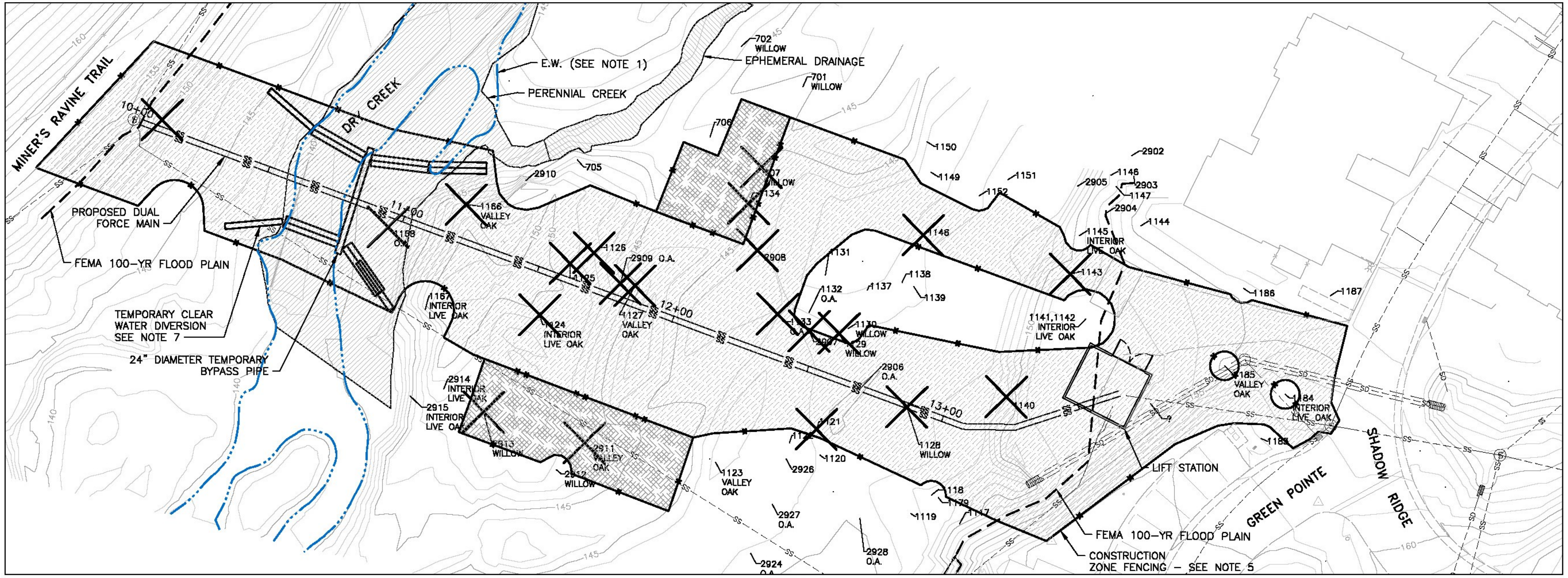

PLAN
SCALE: 1"=20'

LEGEND

▨ TEMPORARY SOIL SPOILS STORAGE AREA

▨ CONSTRUCTION ZONE

▨ PERENNIAL CREEK

▨ EPHEMERAL DRAINAGE

NOTES

1. EDGE OF WATER (E.W.) WAS MAPPED FROM AERIAL PHOTOGRAPHY FLOWN ON 3–3–2015.
2. TREES DESIGNATED AS ╳ TO BE REMOVED. CONTRACTOR TO PROTECT REMAINING TREE
3. LIMITS OF MAXIMUM PERMITTED CONSTRUCTION ZONE ASSUME 1.5H:1.0V TRENCH SIDEWALL LAYBACK AND INCLUDES A 12–FOOT WIDE BUFFER FOR EQUIPMENT & MATERIALS. SEE DETAIL 5/C–104
4. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE AREAS DESIGNATED AS "ENVIRONMENTALLY SENSITIVE AREAS" AS SHOWN ON THE PLANS. THESE AREAS ARE PROTECTED, AND NO ENTRY BY THE CONTRACTOR FOR ANY PURPOSE WILL BE ALLOWED UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE CITY'S PROJECT MANAGER. THE CITY AND CONTRACTOR'S PROJECT MANAGERS WILL TAKE MEASURES TO ENSURE THAT CONSTRUCTION CREW DO NOT ENTER OR DISTURB THESE AREAS, INCLUDING GIVING WRITTEN NOTICE TO CREW MEMBERS.
5. FURNISH/INSTALL, AND MAINTAIN TEMPORARY CONSTRUCTION FENCING AS DELINEATED ON THIS PLAN AND AS DIRECTED BY THE CITY'S PROJECT MANAGER.
6. IN STREAM CONSTRUCTION ACTIVITIES WILL BE LIMITED TO A PERIOD BETWEEN JUNE 15 AND OCTOBER 15. ALL FORCE MAIN PIPELINE CONSTRUCTION SHALL BE COMPLETED WITHIN THIS TIME FRAME.
7. TEMPORARY K RAIL CLEAR WATER DIVERSION SHALL COMPLY WITH SECTION NS–5 OF CALTRANS CONSTRUCTION SITE BMP MANUAL.
8. PROPOSED CONSTRUCTION FENCING WITHIN DRIP LINE, SHALL BE PLACED 5 FEET MIN. FROM TRUNKS OF TREES TO BE PRESERVED AS SHOWN.
9. TREES BEYOND CONSTRUCTION, STAGING & SPOILS AREAS ARE NOT SHOWN FOR CLARITY.

REDUCED HALF SIZE (11X17)

Rev	Date	Description
△		
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Designed By: C. RAMIREZ
Drawn By: K. MEYER
Checked By: R. DEMIS
Approved By: T. GRAU

Verify Scales
BAR IS ONE INCH ON ORIGINAL DRAWING SIZE D (34"X22")
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

90%
SUBMITTAL
02–08–2016
NOT FOR CONSTRUCTION

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Sacramento, CA 95833
T 916.399.0580
www.hatchmott.com

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CITY OF ROSEVILLE
ENVIRONMENTAL
UTILITIES DEPARTMENT
2005 HILLTOP CIRCLE
ROSEVILLE, CA 95747
(916) 774-5688

Scale: 1"=20'
Filename: EN–01.dwg
Contract No:
Date: 08/13/2015

CITY OF ROSEVILLE
SHADOWBROOK LIFT STATION & FORCE MAIN
ENVIRONMENTAL PROTECTION PLAN

Sheet No. EN–01
Page No. 4 of X

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Figure 5. Area of Disturbance
2015-020 Shadowbrook Lift Station and Force Main

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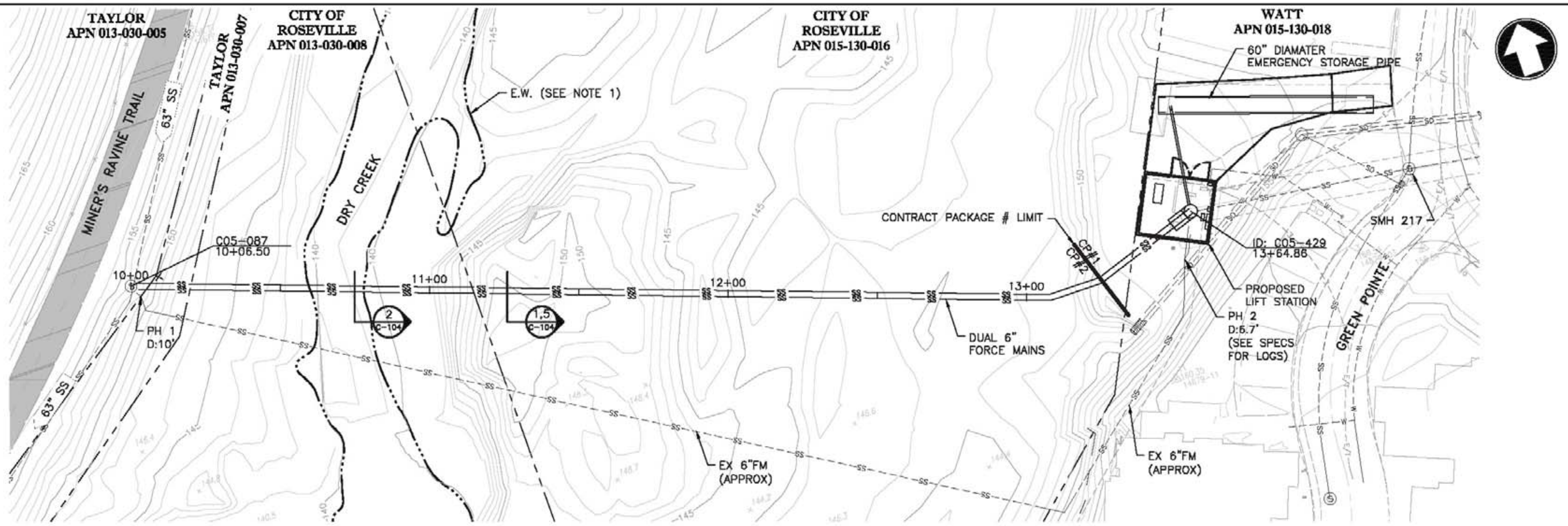
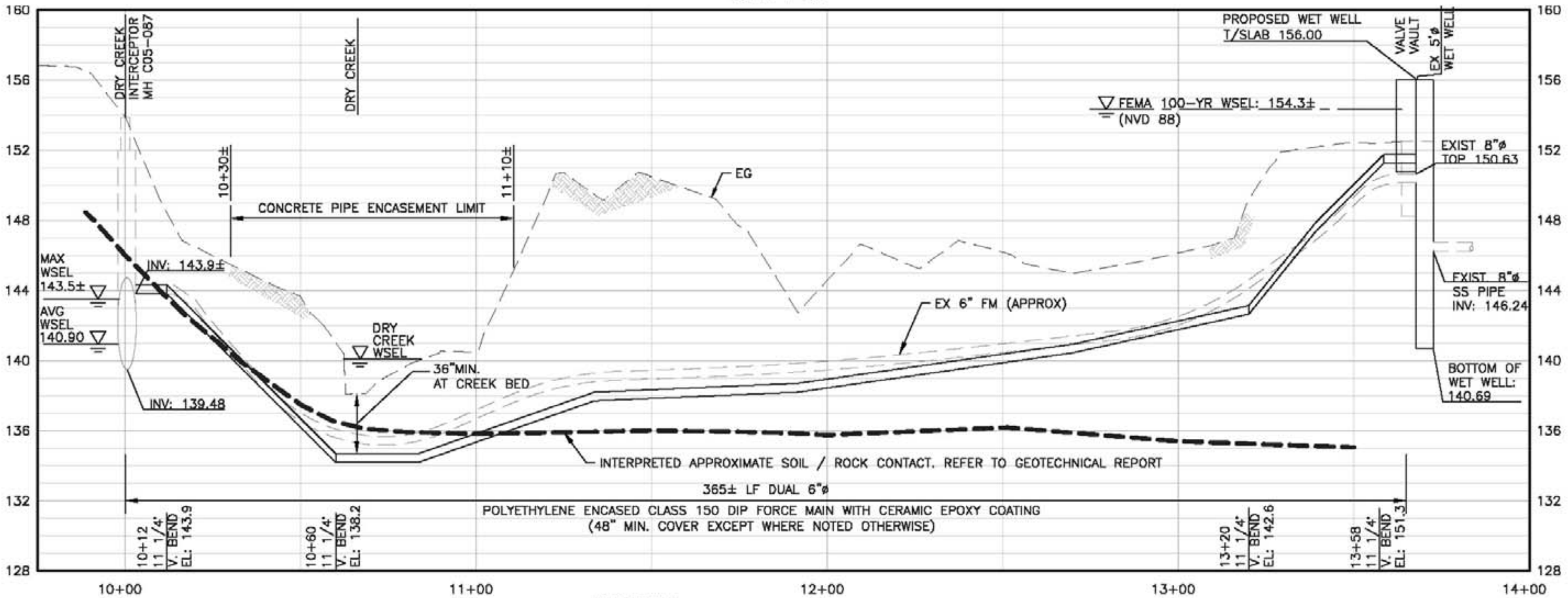


PLAN

SCALE: 1"=20'



PROFILE

SCALE: 1"=20' HORIZ.
1"=4' VERT.

NOTES

1. EDGE OF WATER (E.W.) WAS MAPPED FROM AERIAL PHOTOGRAPHY FLOWN ON 3-3-2015.
2. FURNISH AND INSTALL APPROVED BACKFLOW PREVENTOR FOR USE WITH EXISTING HYDRANTS TO CLEAN LIFT STATION.
3. INSTALL AND OPERATE TEMPORARY SEWAGE BY-PASS SYSTEM. COORDINATE WITH CITY OPERATIONS STAFF PRIOR TO DEVELOPING DETAILED WORK PLAN. THE WORK PLAN WILL BE A REQUIRED SHOP DRAWING/SUBMITTAL. SEE TECHNICAL SPECIFICATIONS, SECTION 2145.
4. REFER TO GEOTECHNICAL REPORT (JULY 2015) AND ADDENDUM PREPARED BY BLACKBURN CONSULTING FOR SOIL BORINGS AND INTERPRETATIONS.
5. NEW LIFT STATION SHALL BE OPERATED CONTINUOUSLY FOR 7 DAYS PRIOR TO DISMANTLING THE TEMPORARY SEWAGE BY-PASS SYSTEM.
6. INSTALL TEMPORARY 6-FOOT HIGH CHAINLINK FENCE AROUND LIFT STATION WORK SITE. SEE EN-01 FOR TEMPORARY CONSTRUCTION FENCING WITHIN THE CREEK.
7. ABANDON EXISTING 6" FORCE MAIN BY PLACING A 2-FOOT LONG CONCRETE PLUG IN BOTH ENDS.
8. WETLANDS, TREE IMPACTS, CONSTRUCTION ZONES, FEMA 100-YR FLOOD PLAIN ARE SHOWN ON ENVIRONMENTAL PROTECTION PLAN (EN-01).
9. PIPE JOINTS SHALL BE DEFLECTED WITHIN MANUFACTURERS RECOMMENDATIONS. INSTALL FITTINGS AS NOTED ON PLANS.
10. REFER TO SITE DETAIL SHEET FOR REGRADING IN THE VICINITY OF THE LIFT STATION.

REDUCED HALF SIZE (11X17)

Rev	Date	Description

Designed By: C. RAMIREZ
Drawn By: K. MEYER
Checked By: R. DEMIS
Approved By: T. GRAU

Verify Scales
BAR IS ONE INCH ON ORIGINAL DRAWING SIZE D (34"X22")
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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CITY OF ROSEVILLE
SHADOWBROOK LIFT STATION & FORCE MAIN
SFM1
PLAN & PROFILE
10+00 TO 10+XX

Sheet No. C-01
Page No. 4 of X

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Figure 6. Trenching Profile
2015-020 Shadowbrook Lift Station and Force Main

Lift Station Structure

To better protect the lift station from the threat of inundation and improve accessibility during a severe storm event, the top of the station wet well/valve vault and surrounding concrete pad would be raised approximately 4 feet to an elevation of 156.0 feet.

The following concept has been recommended for implementing the above upgrades:

- Gut the existing wet well and valve vault and install a new fiberglass wet well within the existing wet well. The annular space between the existing and new wet well would be grouted per the fiberglass liner manufacturer's recommendations. The existing valve vault would also be replaced with either a fiberglass or concrete structure. The top of the new wet well and valve vault would be set at an elevation of 156.0 feet.
- Equip the new wet well with new piping and submersible pump rail removal system and primary and backup wet well level sensing equipment. The existing submersible pumps could be reinstalled or be replaced with new submersible pumps of the same capacity and stored at the City Corp Yard as un-installed backups.
- Remove the existing concrete slab within the concrete masonry unit (CMU) security enclosure, raise the grade approximately 3.7 feet within the enclosure, and pour a new slab and raised housekeeping pad for the pump control panel.
- Remove the existing overhead beam-hoist system.
- Raise the existing CMU wall approximately 3.7 feet to maintain an approximate eight-foot height above the surrounding finished grade. The CMU enclosure would also be extended to enclose the existing concrete pad area to the west.

The pad would be raised and a standby generator would be installed within the newly enclosed area for security, safety, and aesthetic reasons. Modifications to the existing west and north CMU wall would be made to facilitate egress within the enclosure.

Electrical and Instrumentation System

The existing Roseville Electric services, automatic transfer switch, and metering panel with main disconnect are all proposed for reuse. These wall-mounted panels would have to be raised to accommodate the raising of the slab within the lift station security enclosure.

A new standby generator (15 kW) with sound attenuating enclosure and diesel fuel (minimum 48 hours of fuel) would be installed at the lift station. A new automatic transfer switch would be installed to monitor utility power, operate the standby generator, and provide power to the pump control panel.

The existing pump control panel would be reused; however, it would be relocated to a new concrete pad extended above the raised finished grade. New wet well level transducer and backup float switches would be provided. Site lighting would be replaced with new light-emitting diode type flood lights and will employ cut off fixtures to focus lighting and minimize "light spill." Lighting would be installed at the standby generator area. Seal-off fittings would be added to the wet well conduits extending from the existing handhole to the pump control panel. The existing handholes would be extended up to the raised finished grade. All new exposed conduits would be PVC coated galvanized rigid steel, except conduits purposed for lighting and receptacles which may be galvanized rigid steel.

Force Main

New dual six-inch diameter replacement force mains would be installed between the upgraded sewage pumping station and the interceptor west of Dry Creek (Figure 4). The force mains would be valved at the lift station discharge such that only one is in service at any given time and the City Environmental Utilities operating staff could readily switch from use of one to the other. The existing force main would be abandoned in place after installation of the new dual force mains.

The information available on the alignment of the existing force main suggests it extends approximately 100 feet to the south of the Shadowbrook Lift Station before turning west and crossing the riparian corridor within the Dry Creek Floodway. The existing force main connects to Manhole C05-087. The proposed replacement force mains would be constructed in a more direct alignment between the lift station and Manhole C05-087 and would therefore cross Dry Creek approximately 70 feet to the north of the presumed location of the existing force main, as shown in Figure 4.

The dual force mains would be installed at a nominal depth of cover of approximately five feet, except where passing through abrupt changes in surface topography and localized high spots where it would be installed at up to 12 feet in depth. The dual force mains would be installed within a common trench with the force mains set at an approximate two-foot centerline-to-centerline separation. Where the force main trench passes below Dry Creek, it would be cut through the top 24 inches of volcanic breccia and be backfilled with a controlled low strength material (CLSM) to provide a trench section that is protected from potential stream scour in severe flood events. Construction detail of installation of the dual force mains, both above and below the rock interface is shown on **Figure 7.** ***Dual Force Mains Installation Detail.***

The contract documents would require the contractor to cut vertical trenches and use shoring. Spoils from the trenching operation would be temporarily stored in two areas along the trenching alignment. Spoils storage areas are shown on Figure 5.

The dual force mains would be installed within the APE, between the Shadowbrook Lift Station and the Dry Creek Interceptor. When the construction crosses through the actual stream, approved stream diversion barriers would be installed upstream and downstream of the crossing along with temporary piping along the axis of the stream. Dry Creek would be diverted through the piping during the force mains construction within the streambed. The stream diversion devices would be removed immediately following completion of the work within the streambed. Potential dewatering techniques are described in more detail in the following section. Disturbed surface areas within the riparian corridor would likewise be restored immediately following testing of the completed force mains. Oak tree replacement, where required, would follow the City's Native Oak Tree ordinance. Other Best Management Practices (BMPs) within the riparian corridor would include the use of silt fencing along the perimeter of the construction work area and provision of gravel tracking pads between the work area and local roadways.

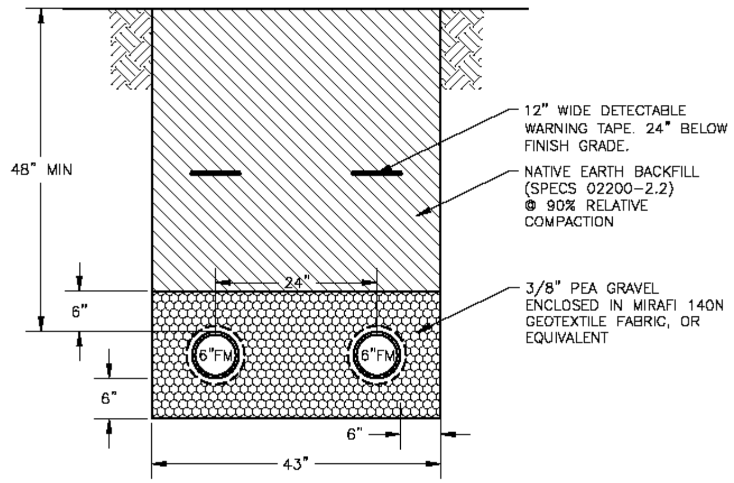
The stream crossing construction would be scheduled for the dry season as required by state and federal permits, typically mid-June through mid-October.

Clear-Water Diversion

In order to install the dual force mains, it would be necessary to temporarily de-water a segment of Dry Creek and divert flows through the project area. A containment dam would be established in conformance with City specifications and regulations, as required by the California Department of Fish and Wildlife (CDFW) and National Oceanic Atmospheric Administration (NOAA). The

NOTES:

1. BACKFILL SHALL BE MECHANICALLY CONSOLIDATED. BEDDING SHOVEL SLICED UNDER THE HAUNCHES OF THE PIPE

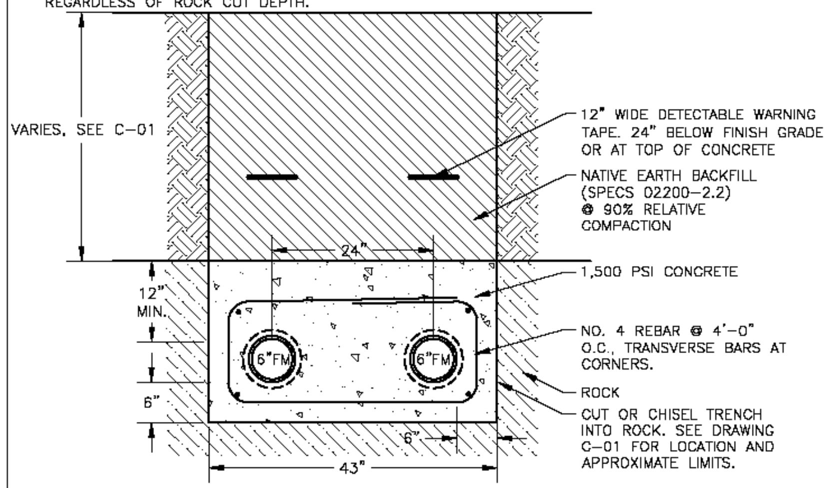


DETAIL 1 / C-1 DUAL SEWER FORCE MAIN SOILS TRENCH

SCALE: 1"=2'

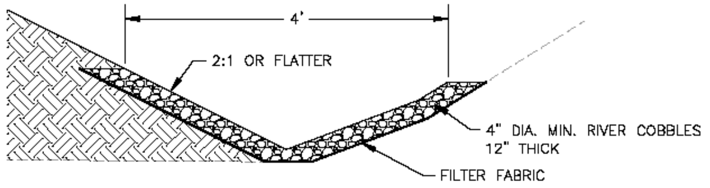
NOTES:

1. REFER TO DIMENSIONS FROM DETAIL 1, UNLESS OTHERWISE NOTED.
2. PROVIDE 24" THICK CONCRETE WITHIN "CONCRETE PIPE ENCASEMENT LIMIT" SHOWIN ON SHEET C–01, REGARDLESS OF ROCK CUT DEPTH.



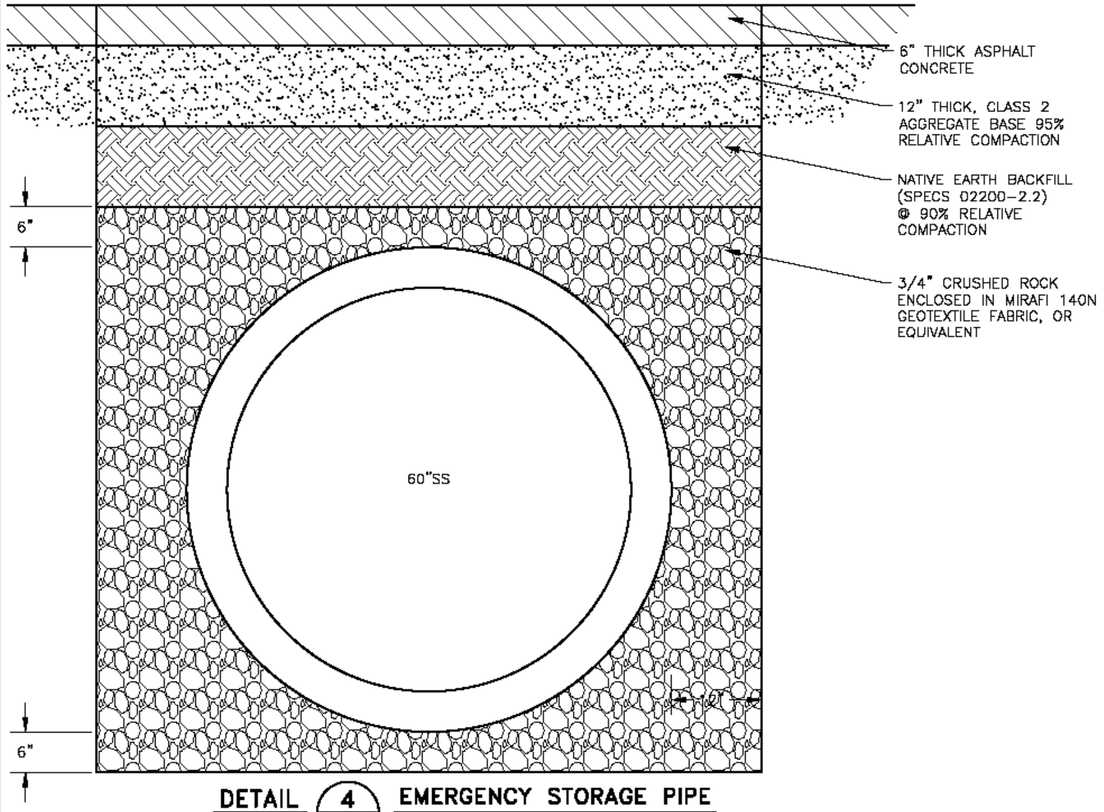
DETAIL 2 / C-1 DUAL SEWER FORCE MAIN ROCK TRENCH

SCALE: 1"=2'



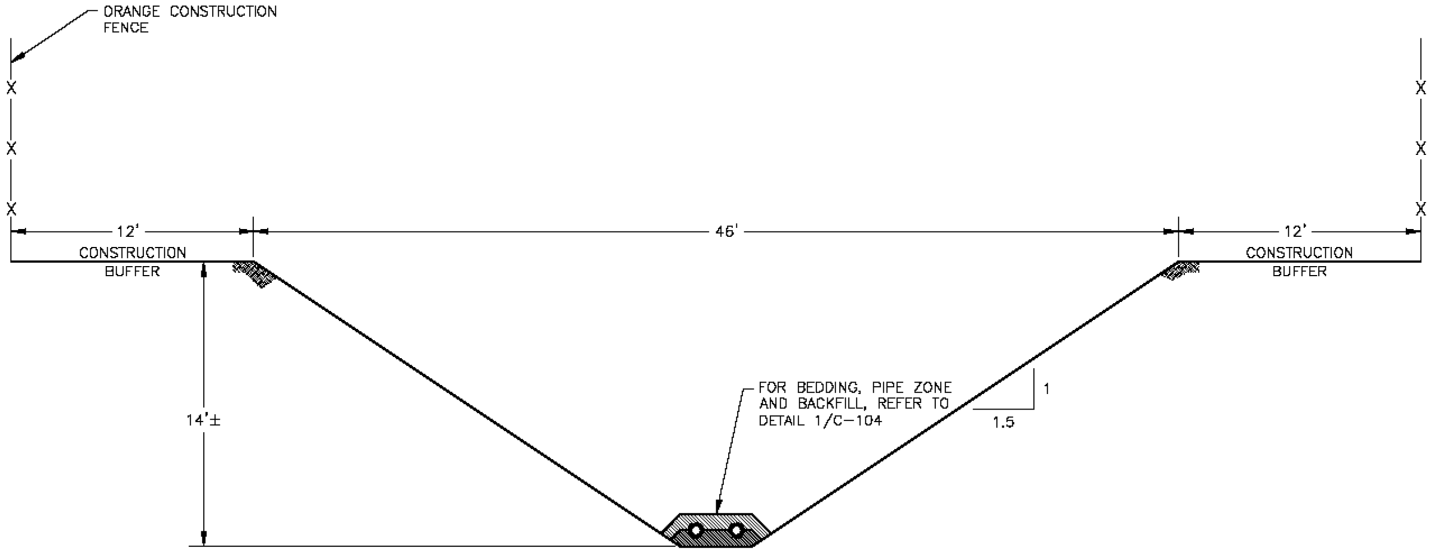
DETAIL 3 / C-7 DRAINAGE CHANNEL

SCALE: 1"=2'



DETAIL 4 / – EMERGENCY STORAGE PIPE

SCALE: 1"=2'



DETAIL 5 / EN-01 TRENCH @ MAX DEPTH

SCALE: 1"=4'

REDUCED HALF SIZE (11X17)

Rev	Date	Description
△		
△		
△		
△		
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△		

Designed By: T. GRAU
Drawn By: L. KIRK
Checked By: R. DEMIS
Approved By: T. GRAU

Verify Scales
BAR IS ONE INCH ON ORIGINAL DRAWING SIZE D (34"X22")
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

90%
SUBMITTAL
02–08–2016
NOT FOR CONSTRUCTION

Hatch Mott MacDonald
2495 Natomas Park Drive, Ste 530
Sacramento, CA 95833
T 916.399.0580
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Client Information:
CITY OF ROSEVILLE CALIFORNIA
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ENVIRONMENTAL
UTILITIES DEPARTMENT
2005 HILLTOP CIRCLE
ROSEVILLE, CA 95747
(916) 774-5688

Scale: 1"=2'
Filename: C–104.dwg
Contract No:
Date:

CITY OF ROSEVILLE
SHADOWBROOK LIFT STATION & FORCE MAIN
MECHANICAL & SITE DETAILS

Sheet No. C–104
Page No. 17 of X

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File: pw:\\pimspwise.hmmg.cc:pw_wat\Documents\345265–ROSEVILLE–SHADOWBROOK SEWER PS\Drawings_Models\02_C_Civil\C–100 to C–103.dwg
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STSN: VISRETAIN=1, PSLTSCALE=1, LTSCALE=1

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 7. Dual Force Mains Installation Detail
2015-020 Shadowbrook Lift Station and Force Main

containment dam would be constructed within the channel banks within the project limits upstream, and possibly downstream, of the construction activities. The City would construct the creek diversion to isolate the work area from Dry Creek using one of four options (or equivalent, as may be approved by the agencies):

- Approximately 60 cubic yards of clean gravel material wrapped in a geofabric;
- A k-rail that is wrapped in a geofabric and backfilled with approximately 60 cubic yards of clean gravel;
- Bladders that are filled with creek water and placed within the creek channel; or
- Similar diversion structures placed upstream and possibly downstream; however, creek flow through the construction site would be piped rather than via an open, flowing channel. It is anticipated that the contractor would use backhoes and excavators from the upslope bank to install and remove the diversion.

Miners Ravine Trail Detour and Reconstruction

A portion of the Miners Ravine Trail, a multi-use path for cyclists, pedestrians, and non-motorized vehicles, transects the project area and would need to be closed during construction. The City of Roseville would provide notice of the trail closure at least two weeks in advance by posting notices near the closure of the trail, on the City's website, and through the City's Trail Alert email subscription. Additionally, a detour map would be posted at each end of the trail closure to direct trail users to an alternate route (see Figure 4.) until construction is complete. If necessary, the trail would need to be re-constructed to City standard (10 feet in width with 2-foot shoulders) and meet the design/construction standards for the trail (i.e. striping). The City's Public Works Department would require an inspection of the trail after reconstruction is complete.

Lift Station and Force Main Upgrade Recommendation Summary

The following are the recommended upgrades for the Proposed Project:

- Install new fiberglass wet well and replacement valve vault within the existing wet well/valve vault following the removal of existing pumping equipment and piping;
- Raise grades of wet well and security enclosure pad to elevation 156.0 feet, approximately 1.7 feet above the Federal Emergency Management Agency (FEMA) Floodplain elevation. Re-grade surrounding site to conform;
- Install a standby generator and automatic transfer switch at the lift station;
- Modify the existing lift station masonry security walls to maintain an approximate 8-foot height and enclose standby generator;
- Replace the existing pumps, removal hardware, wet well level transducer and floats, and piping and valves within the wet well/valve vault. Adjust the station bypass pump connection to accommodate the raise in lift station grade;
- Reuse and remount the existing electrical service entrance switchgear and pump control panel to accommodate the raise in lift station grade. Interconnect with the standby generator;
- Maintain the existing licensed 450mhz telecommunication system;
- Install on-site emergency storage;
- Install dual force mains between the lift station and the Dry Creek interceptor; and

- Abandon existing force main in place.

2.6 Construction and Project Phasing

The Proposed Project would be constructed in two phases (Phase I and II). Phase I would consist of construction of the proposed pumping system, emergency storage, lift station structure, and electrical and instrumentation system. Phase II would consist of construction of the proposed force main and would require a clear water diversion to temporarily de-water a segment of Dry Creek and divert flows through the project area. In addition, a portion of the Miners Ravine Trail would need to be closed during this period of construction.

Phase I would be scheduled to commence between June 2016 and October 2016 and Phase II would be scheduled to commence the following year between June 2017 and October 2017. Both phases would include, but not be limited to, the following standard construction equipment: excavator, wheel loader, backhoe, three-axle (dump) truck, portable compactor, and foreman truck. Up to six construction workers would be present during construction activities. Additionally, a crane and boom truck would be necessary for installation of the fiberglass wet well liner and the temporary clear water diversion during construction of Phase II.

Equipment storage and parking (staging) would occur in three locations as depicted on Figure 4. Staging for construction of Phase I would occur within the Shadowbrook Apartment complex on existing paved areas. For construction of Phase II, which includes operations on the west side of the creek, staging would occur on a city-owned parcel adjacent to the Miners Ravine trail west of the project site. Material laydown would occur in two locations: adjacent to the existing lift station for Phase I and immediately west of the terminus of the proposed force main on the west side of the creek for Phase II (see Figure 4).

2.7 City Of Roseville Mitigating Ordinances, Guidelines, and Standards

The CEQA Guidelines allow the use of previously adopted development policies or standards as mitigation for the environmental effects of future projects, when the standards have been adopted by the City with findings, based on substantial evidence, that the policies or standards will substantially mitigate environmental effects, unless substantial new information shows that the policies or standards will not substantially mitigate the effects (§15183[f]). In April 2008, the City of Roseville adopted Findings of Fact related to the mitigating policies and standards, and adopted the City of Roseville CEQA implementing procedures for the preparation, processing, and review of environmental documents (Resolution 08-172). These Findings are applicable to the following regulations and ordinances, which include standards and policies that are uniformly applied throughout the City, and will substantially mitigate specified environmental effects of future projects:

- Noise Regulation (RMC Ch.9.24)
- Urban Stormwater Quality Management and Discharge Control Ordinance (RMC Ch.14.20)
- Stormwater Quality Design Manual (Resolution 07-432)
- City of Roseville Design and Construction Standards (Resolution 07-137)
- Community Design Guidelines (Resolution 95-347)
- Tree Preservation Ordinance (RMC Ch.19.66)

The City's Mitigating Ordinances, Guidelines, and Standards are referenced, where applicable, in the Environmental Checklist, and will be implemented by the City as part of the Proposed Project to reduce potential impacts to a less than significant Level.

2.8 Environmental Commitments

In addition to the City's Mitigating Ordinances, Guidelines, and Standards discussed above, the project would implement a variety of BMPs and other measures to avoid short- and long-term effects on the physical and human environment. These activities would be included in the contract specifications for contractors working on the Proposed Project, and implemented during project construction. The following BMPs would be implemented to maintain water quality and aquatic habitat objectives defined by current regulatory standards.

BMP — 1: Conduct Environmental Awareness Training for Construction Personnel

Before any work occurs in the project area, including grading, a Qualified Biologist will conduct mandatory contractor/worker awareness training for construction personnel. The awareness training will be provided to all construction personnel to brief them on the need to avoid impacts on biological resources and the penalties for non-compliance. If new construction personnel are added to the project, the City will ensure that the personnel receive the mandatory training from the biologist before starting work.

BMP — 2: Install Construction Barrier Fencing to Protect Environmentally Sensitive Areas

The City will install orange construction barrier fencing to identify environmentally sensitive areas (ESAs). ESAs in and adjacent to the construction area comprise mixed riparian forest, native oak trees greater than six inches diameter breast height (DBH), wetland drainages, and any trees that support migratory bird or raptor nests. Before construction, the City will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the ESAs to indicate these locations. The protected area will be clearly identified on the construction plans. The fencing will be installed before construction activities are initiated and will be maintained throughout the construction period. The following note will be included in the construction plans:

> *"The contractor's attention is directed to the areas designated as "environmentally sensitive areas" as shown on the plans. These areas are protected, and no entry by the contractor for any purpose will be allowed unless specifically authorized in writing by the City's project manager. The City and contractor's project managers will take measures to ensure that construction crew do not enter or disturb these areas, including giving written notice to crew members."*

Temporary fences around the ESAs will be installed as the first order of work. Temporary fences will be furnished, constructed, maintained, and removed as shown on the plans, as directed by the project engineer. The fencing will be commercial-quality woven polypropylene, orange in color, and at least four feet high (Tensor Polygrid or equivalent).

BMP — 3: Retain a Biologist to Monitor Construction Activities in the Creek Corridor

The City will retain a biologist to make a weekly monitoring visit to the project site. The biological monitor will advise the construction crew, as needed how to comply with all project implementation restrictions and guidelines. Furthermore, the biological monitor will be responsible for notifying the contractor if the ESA barrier fencing needs maintenance.

BMP — 4: Avoid and Minimize Disturbance of Dry Creek and Associated Aquatic Habitat and Restore all Temporarily Disturbed Areas

To the extent possible, the City and contractor will minimize impacts on Dry Creek and associated aquatic habitat by implementing the following:

- Prior to working within the Dry Creek corridor, all heavy equipment will be checked by the City inspector and maintained daily to prevent leaks of materials that if introduced to water could be deleterious to aquatic life;
- Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances associated with project-related activities that could be hazardous to aquatic life will be prevented from contaminating the soil or entering Dry Creek channel;
- During construction, the City will not dump any material in the stream channel except as shown on the project plans. All such debris and waste will be picked up daily and properly disposed of at an appropriate site. All construction debris and associated materials will be removed from the work site upon completion of the project;
- Sediment fences will be installed in appropriate locations to reduce the introduction of sediment into creeks during construction. Any overburden material from the Proposed Project would not be sidecast into the creek channel, but will be stabilized or stored off site at approved disposal sites to preclude increased risk of sediment input to creeks;
- The City and contractor will establish spill prevention and countermeasure plan before project construction begins; the plan will include on-site handling criteria to avoid input of contaminants to the waterway. A staging and storage area will be provided away from the waterway for equipment, construction materials, fuels, lubricants, solvents, and other possible contaminants. This plan will be approved by the City project manager prior to the start of construction;
- After construction, the work area within the creek corridor will be stabilized and restored according to the erosion and sediment control standards set forth in the *City's Stormwater Quality BMP Guidance Manual for Construction* (March 2007);
- All maintenance materials (e.g., oils, grease, lubricants, antifreeze, and similar materials) will be stored off-site; and
- During construction, all vehicles and equipment required on site will be parked or stored at the staging areas.

Precautions to minimize turbidity/siltation will be taken into account during project planning and implementation. Such precautions may entail the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches. Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures will be taken. The sediment barrier(s) will be maintained in good operating condition throughout the construction period. Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged silt fencing, coir logs, coir rolls, and/or straw bale dikes. Non-biodegradable silt barriers (such as plastic silt fencing) shall be removed after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season).

BMP — 5: Minimize Potential for the Long-Term Loss of Mixed Riparian Forest

To the extent possible, the City will minimize the potential for the long-term loss of riparian vegetation by trimming vegetation rather than removing entire shrubs. Shrubs that need to be trimmed will be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting will be limited to the minimum area necessary within the construction zone. Disturbance or removal of vegetation will not exceed the minimum necessary to complete operations. Except for the vegetation specifically identified for trimming and/or removal in the notification, no native oak trees with a trunk diameter greater than six inches DBH will be removed or damaged without prior consultation and approval of a City Planning Department representative. Using hand tools (e.g., clippers, chain saw), trees may be trimmed to the extent necessary to gain access to the work sites. All cleared material/vegetation will be removed out of the riparian/stream zone.

BMP — 6: Conduct a Pre-Construction Survey for Western Pond Turtles and Implement Measures to Avoid Impacts

To avoid construction-related impacts on western pond turtles, the City will retain a wildlife biologist to conduct a pre-construction survey for western pond turtles no more than 48 hours before the start of construction. The wildlife biologist will look for adult pond turtles, in addition to nests containing pond turtle hatchlings and eggs. If a western pond turtle is located in the construction area, the biologist will move the turtle to a suitable aquatic site outside the construction area. If an active pond turtle nest containing either pond turtle hatchlings or eggs is found, the City will consult the CDFW to determine and implement appropriate avoidance measures, which may include a “no-disturbance” buffer around the nest site until the hatchlings have moved to a nearby aquatic site.

BMP —7: Construct Outside of Nesting Season or Conduct Pre-Construction Raptor Nesting Surveys

To avoid disturbance of raptor breeding and nesting activity, including nesting of sensitive raptors, project activities will be avoided during the typical raptor breeding season of March through August, to the extent feasible. If construction must take place during the typical nesting season, pre-construction surveys will be conducted by a Qualified Biologist no more than 30 days prior to initiation of proposed construction activities.

Surveys will be conducted to determine if active nesting is occurring on or directly adjacent to the study area. If active nests are found on or immediately adjacent to the site, survey results will be submitted to CDFW and consultation will be initiated with CDFW to determine appropriate avoidance measures. If no nesting is found to occur, necessary tree removal and other project activities could then proceed.

BMP — 8: Restore all Temporarily Disturbed Areas and Comply with Agency Permitting Requirements to Mitigate Permanent Wetland and Riparian Impacts

The City shall comply with all applicable U.S. Army Corps (USACE), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), California Regional Water Quality Control Board (RWQCB), and National Marine Fisheries Service (NMFS) permitting and mitigation requirements for wetland and riparian habitats.

As part of Clean Water Act USACE Section 404 permitting, the City shall ensure the following:

- Avoid and minimize impacts through project design and restore all temporarily disturbed wetlands;
- Compensate for any permanent wetland impacts by acquiring mitigation bank credits at an agency approved mitigation bank.

As part of the CDFW Streambed Alteration Agreement process, the City shall ensure the following:

- Minimize riparian impacts via implementation of BMP-5 and restore all temporarily disturbed areas;
- Compensate for any permanent riparian impacts by acquiring mitigation bank credits at an agency approved mitigation bank.

The City is responsible for obtaining all required permits and authorizations from local, State, and federal agencies. If a conflict arises between the provisions of any of the permits, the City shall comply with the provision that offers the greatest protection to water quality, Species of Special Concern, and/or Critical Habitat. Copies of the permits shall be provided to the construction crew with the construction plans.

BMP — 9: Avoid the Introduction or Spread of Noxious Weeds in the project Area

To avoid the introduction or spread of noxious weeds into previously uninfested areas (especially within the riparian community along Dry Creek), the City will revegetate disturbed areas immediately after construction is complete using certified weed-free native and nonnative mixes.

BMP — 10: Comply with Requirements of the Tree Preservation Chapter of the Roseville Zoning Ordinance

The City will comply with the City's Tree Preservation Ordinance as applicable, including avoidance, minimization, or compensation for the removal or disturbance of native oak trees greater than six inches DBH during construction. If native oak trees will be affected by the project, the City will be required to prepare a tree mitigation plan that identifies trees that qualify for protection and specifies mitigation for impacts. For any oak trees that would be removed, the City will mitigate the impact through either on-site planting or use of the City's in-lieu fee program.

2.9 Regulatory Requirements, Permits, and Approvals

Table 1. Regulatory Requirements, Permits, and Approvals

Agency or Organization	Approval or Permit
State Water Resources Control Board (SWRCB)	National Pollutant Discharge Elimination System (NPDES) permit, Construction Storm Water General Permit (including the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) and best management practices
Central Valley Regional Water Quality Control Board (CVRWQCB)	Clean Water Act Section 401 Permit
Central Valley Flood Protection Board	Floodplain Encroachment Permit or Waiver
U.S. Army Corps of Engineers (USACE)	Clean Water Act Section 404 Permit
U.S. Fish and Wildlife Service (USFWS)	Federal Endangered Species Act Compliance
National Marine Fisheries Service (NMFS)	Federal Endangered Species Act Compliance
California Department of Fish and Wildlife (CDFW)	1602 Stream Bed Alteration Agreement and California Endangered Species Act Compliance
Placer County Air Quality Management District (PCAQMD)	Air permit for the generator (if more than 50 horsepower) and Authority to Construct Permit
Roseville City Council	Adoption of the Mitigated Negative Declaration for the Proposed Project and a Mitigation Monitoring and Reporting Plan
Roseville City Council	Project Approval

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SECTION 3. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

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
☒ Geology and Soils
☐ Greenhouse Gas Emissions
☐ Hazards/Hazardous Materials
☐ Hydrology/Water Quality
☐ Land Use and Planning
☐ Mineral Resources
☒ Noise
☒ Paleontological Resources
☐ Population and Housing
☐ Public Services
☐ Recreation
☐ Transportation/Traffic
☐ Tribal Cultural Resources
☐ Utilities and Service Systems
☐ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

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

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

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

I find that the 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. ☐

I find that although the 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 project, nothing further is required. ☐

Mark J Morse
City of Roseville
Mark Morse, Environmental Coordinator

3-21-16
Date

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SECTION 4. ENVIRONMENTAL CHECKLIST AND DISCUSSION

4.1 Aesthetics

4.1.1 Environmental Setting

As described in Section 2.2, the Proposed Project site is located adjacent and west of the Shadowbrook Apartments complex between Shadow Ridge Road and the Miners Ravine Trail. The center of the project site is characterized by mixed oak woodland and riparian vegetation communities, with Dry Creek transecting the project site adjacent to the Miners Ravine Trail. The project site extends northwest to East Street and west to Parry Street. A low-density residential development is located on the northwest side of East Street. See ***Representative Site Photos 1 through 8*** for views of the existing project setting.

4.1.2 Aesthetics (I.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Would the project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

a) ***No Impact.*** The City of Roseville General Plan 2025 does not identify any scenic vistas within the Roseville City limits. No impact would occur.

b) ***No Impact.*** There are no state-designated scenic highways in Placer County. Therefore, no impact would occur.

c) ***Less than Significant Impact.*** The Proposed Project would involve the enhancement and replacement of existing facilities. The project will also result in the removal of several trees (as discussed further in the **Biological Resources, Section 4.4** of this document).The project site is characterized by mixed riparian woodlands, annual grasslands, perennial drainage and urban uses. The project has been designed to minimize the number of trees to be removed. Additionally, construction within the project site would be temporary and would not permanently degrade the character of the project area. No new operational characteristics would be introduced that would substantially degrade the existing visual character of the site. Once construction is complete, the site would be returned to pre-project conditions. A less than significant impact would occur. No mitigation is required.

d) ***No Impact.*** As described previously under item C), the Proposed Project would replace an existing use. The Proposed Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the proximity of the Project site. Security lighting would use cutoff fixtures to focus lighting and minimize "light spill." No impact would occur.

4.2 Agriculture and Forestry Resources

4.2.1 Environmental Setting

The project site is located within an area zoned as Attached Housing (R3) and Floodway (FW) and is designated within the City of Roseville General Plan Land Use Element as High Density Residential (HDR) Low Density Residential (LDR) and Open Space (OS) (City of Roseville 2015). The project site is in an urban area surrounded primarily by residential, commercial, and office land uses (City of Roseville 2015). The majority of project site has functioned as a floodway for Dry Creek. The existing lift station and force main has been maintained by the City of Roseville since its construction in the late 1970s. The project site has not been used for agriculture or developed for forestry resources for at least 40 years.

4.2.2 Agriculture and Forestry Resources (II.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project 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)	Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c)	Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d)	Would the project result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

a) ***No Impact.*** As described previously in Section 4.2.1, the project site is designated HDR/LDR in the Roseville General Plan and is zoned as R3/FW. The project site is designated as “Other Lands” by the State Farmland Mapping and Monitoring Program. The proposed project would not result in the conversion of Prime Farmland, Unique Farmland or Farmland of Statewide Importance. No impact would occur.

b) ***No Impact.*** See discussion under item a). The Proposed Project would not be located within an agricultural use zone. The project site is not under a Williamson Act contract (City of Roseville 2015). Therefore, the project would not result in a conflict with an agricultural zoning designation or a Williamson Act contract. No impact would occur.

c) ***No Impact.*** See discussion under item a). The project Site is not zoned for forest land, timberland, or timberland production (City of Roseville 2015). No impact would occur.

d) ***No Impact.*** The Proposed Project would involve replacing the existing lift station and force main and would return the site to pre-project conditions after the completion of construction. As described in item a), the project site is designated HDR/LDR and is zoned as R3/FW; and therefore, would not convert forest land to non-forest use. No impact would occur.

e) ***No impact.*** See discussion under item a). The Proposed Project would involve the replacement of an existing lift station and force main. There are no agricultural or forest resources on-site. Therefore, the Proposed Project would not result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. No impact would occur.

4.3 Air Quality

An Air Quality Study was conducted by KD Anderson & Associates to evaluate construction-related and operational impacts of the Proposed Project on air quality (KD Anderson 2015; Appendix A). The findings of the Air Quality Study are summarized below.

4.3.1 Environmental Setting

The project site is located in the jurisdiction of the Placer County Air Pollution Control District (PCAPCD). Methods used in the air quality analysis of the Proposed Project are consistent with methods recommended in the PCAPCD document CEQA Air Quality Handbook – Assessing and Mitigating Air Quality Impacts Under CEQA. As recommended in the CEQA Air Quality Handbook, construction-related emissions associated with the Proposed Project were estimated using the Sacramento Metropolitan Air Quality Management District (SMAQMD) Road Construction Emissions Model. See Appendix A for more information regarding the Road Construction Emissions Model.

Criteria Pollutant Significance Thresholds

The Proposed Project site is located in the jurisdiction of the PCAPCD. Portions of the PCAPCD area are within three air basins. The Proposed Project site is within the Sacramento Valley Air Basin (SVAB) portion of the PCAPCD. The SVAB portion of the PCAPCD is located within the Sacramento region non-attainment area for federal ozone standards. The PCAPCD, along with other local air districts in the Sacramento region, are required to comply with and implement the State Implementation Plan (SIP) to demonstrate when and how the region can attain the federal ozone standards. Accordingly, the SMAQMD prepared the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan in December 2008, with input from the other air districts in the region including PCAPCD which adopted the plan. The California Air Resources Board (CARB) determined that the Plan meets Clean Air Act requirements and approved the Plan on March 26, 2009 as a revision to the SIP.

To evaluate ozone and other air pollutant emissions, the PCAPCD has established recommended significance thresholds for emissions of ozone precursors, reactive organic gases (ROG), and nitrogen oxides (NO_X), inhalable particulate matter less than 10 microns in diameter (PM_{10}), and carbon monoxide (CO). Significance thresholds used in this report are from the PCAPCD CEQA Air Quality Handbook and PCAPCD staff.

As the CEQA lead agency, the City of Roseville uses the following PCAPCD recommended project-level significance thresholds to evaluate air quality impacts. The thresholds are:

- 82 pounds per day (ppd) of ROG,
- 82 ppd of NO_X,
- 82 ppd of PM_{10}, and
- 550 ppd of CO.

If the Proposed Project's emissions exceed the above pollutant thresholds, the project would be considered to have a potentially significant effect on regional air quality and the attainment of federal and State Ambient Air Quality Standards.

4.3.2 Air Quality (III.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d)	Would the project expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e)	Would the project create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

a) ***Less than Significant Impact.*** Implementation of the Proposed Project would result in construction activity, which would generate air pollutant emissions. Construction activities such as grading, excavation and travel on unpaved surfaces would generate dust, and can lead to elevated concentrations of PM_{10}. The operation of construction equipment results in exhaust emissions, which include ozone precursors ROG and NO_x, and CO.

Appendix A estimates the amount of criteria pollutant emissions associated with construction of the Proposed Project. Construction of the Proposed Project would result in:

- 3.2 ppd of ROG,
- 33.90 ppd of NOx,
- 6.90 ppd of PM10, and
- 19.90 ppd of CO.

Project-related construction emissions of ROG, NO_x, PM_{10}, and CO would be below PCAPCD recommended significance thresholds as defined in Section 4.3.1. Therefore, the Proposed Project would not conflict with the emissions inventories or obstruct implementation of the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan. A less than significant impact would occur.

b) ***Less than Significant Impact.***

Construction-related Impacts

Implementation of the Proposed Project would result in construction activity, which would generate air pollutant emissions. Construction activities such as grading, excavation and travel on unpaved surfaces would generate dust, and can lead to elevated concentrations of PM_{10}. The operation of construction equipment results in exhaust emissions, which include ozone precursors ROG and NO_x, and CO. As previously described in item a), project-related construction emissions of ROG, NOx, PM_{10}, and CO would be below significance thresholds. Therefore, the impact of the Proposed Project on these criteria pollutant emissions is considered less than significant. No mitigation measures are required.

Long-Term Operational Impacts

As noted previously in Section 4.3.1, emissions associated with long-term operation of the Proposed Project would be primarily associated with use of electricity to operate the lift station pump, and the Proposed Project is not anticipated to result in additional demand for electricity compared to the existing lift station. As a result, the Proposed Project is not expected to increase long-term operational emissions. Therefore, the long-term operational impact on both criteria pollutant emissions is considered less than significant.

c) ***Less than Significant Impact.*** The Proposed Project is within a nonattainment area for ozone and PM. The growth and combined population, vehicle usage, and business activity within the nonattainment area, in combination with other past, present, and reasonably foreseeable projects within the City of Roseville and surrounding areas, could either delay attainment of the standards or require the adoption of additional controls on existing and future air pollution sources to offset emission increases.

The Proposed Project would only involve increased emissions during construction, as the project would not require regular maintenance and would not involve operation emissions beyond current conditions. Construction emissions would occur temporarily (approximately four to five months in this case). Accordingly, the incremental contribution of the Proposed Project’s construction-related emissions would not exceed City recognized project-level thresholds and therefore would not be cumulatively considerable. Therefore, the Proposed Project would result in a less than significant impact, cumulatively.

d) ***Less than Significant Impact.*** Air quality regulators typically define sensitive receptors as schools (preschool-12th grade), hospitals, resident care facilities, residences or day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. A project would have a significant impact on a sensitive receptor if it would result in an unacceptable health risk due to exposure to toxic air contaminants (TACs) that would be emitted from the project.

The Proposed Project consists of the replacement of the existing lift station and force main. Currently, the nearest sensitive receptors are the residents in the Shadowbrook Apartments approximately 100 feet from the emergency generator. Construction activities would result in emissions of diesel particulate matter from heavy construction equipment used on-site and truck traffic to and from the site, as well as minor amounts of TAC emissions from motor vehicles (such as benzene, 1, 3-butadiene, toluene, and xylenes). Health effects attributable to exposure to diesel particulate matter are long-term effects based on chronic (i.e., long-term) exposure to emissions (KD Anderson 2014).

The nature of the Proposed Project does not involve long-term operation of a stationary source of TACs; and therefore, would not expose sensitive receptors to any new sources of substantial pollutant concentrations. A less than significant impact would occur.

e) ***Less than Significant Impact.*** Construction of the Proposed Project could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust during construction. However, construction equipment would be operating at various locations throughout the project site, and any construction activities near sensitive receptors would be temporary. There would be no long-term operational emissions associated with the Proposed Project that would generate odor compounds. Therefore, a less than significant impact would occur.

4.4 Biological Resources

4.4.1 Environmental Setting

A Biological Resource Assessment (BRA) was prepared for the Proposed Project by ECORP Consulting Inc. (ECORP 2015a; Appendix B). The purpose of the BRA is to assess the potential for occurrence of special-status plant and animal species or their habitat, as well as sensitive habitats such as wetlands within the project site and the vicinity. This assessment does not include determinate field surveys conducted according to agency-promulgated protocols. The conclusions and recommendations presented in the BRA are based upon a literature review, database queries, and site reconnaissance. Applicable federal, state, and local regulations are described in detail in Appendix B.

For the purposes of the BRA, special-status species are defined as plants or animals that:

- are listed, proposed for listing, or candidates for future listing as threatened or endangered under the Federal Endangered Species Act (ESA);
- are listed or candidates for future listing as threatened or endangered under the California Endangered Species Act (CESA);
- meet the definitions of endangered or rare under Section 15380 of the California Environmental Quality Act (CEQA) Guidelines;
- are identified as a species of special concern by the California Department of Fish and Wildlife (CDFW);
- are birds identified as birds of conservation concern by the United States Fish and Wildlife Service (USFWS);
- are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1 and 2);
- are plants considered by CNPS as species about which more information is needed to determine their status (CRPR 3), and plants of limited distribution (CRPR 4). CRPR 3 and 4 species are only included in this assessment if they have been identified by local jurisdictions as having local significance or regional importance;
- are plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.); or
- are fully protected in California in accordance with the California Fish and Game Code, Sections 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes).

ECORP biologist/ISA Certified Arborist Krissy Walker (No. WE-11308A) conducted the site assessment on July 15, 2015. Additional field data were collected for this site by ECORP senior biologist Keith Kwan as part of a delineation of Waters of the U.S. conducted on July 30, 2015 and a field assessment of an alternative access point October 22, 2015. See Appendix B for a detailed description of field data collected on-site.

An arborist survey was conducted on June 29, 2015 for the project site by ECORP ISA Certified Arborist Bryan Hill (No. WE-5382A) and biologist Emily Mecke. Collected data included species, diameter at breast height (DBH), dripline radius, structure, and condition. Inventoried trees included all trees (native and nonnative) with a DBH of six inches or greater. Inventoried trees were tagged with a numbered aluminum tag unless a readable tag (from previous, unrelated survey efforts) was already present on the tree. See Appendix B for detailed definitions of tree data collected.

Based on species occurrence information from the California Natural Diversity Database (CNDDB), the literature review, and observations in the field, a list of special-status plant and animal species that have the potential to occur within the project site was generated (ECORP 2015a). Only special-status species, as defined above, were included in this analysis. Each of these species' potential to occur on-site was assessed based on the following criteria:

- **Present** - Species was observed during the site visit or is known to occur within the project boundary based on documented occurrences within the CNDDB or other literature
- **Potential to Occur** - Habitat (including soils and elevation requirements) for the species occurs within the project boundary
- **Low Potential to Occur** - Marginal or limited amounts of habitat occurs and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation
- **Absent** - No suitable habitat (including soils and elevation requirements) and/or the species is not known to occur in the vicinity based on CNDDB records and other documentation

Plant Communities

The three plant communities observed in the project area include oak woodland with a ruderal annual grassland understory, riparian woodland, and disturbed/developed. The oak woodland is dominated by a mix of interior live oak (*Quercus wislizenii*), Oregon ash (*Fraxinus latifolia*), and willow (*Salix exigua*), and the ruderal grass understory includes prostrate amaranth (*Amaranthus blitoides*), ripgut brome (*Bromus diandrus*), mustard (*Brassica nigra*), and Bermuda grass (*Cynodon dactylon*). The riparian woodland is prominent along the creek and includes water primrose (*Ludwigia peploides* ssp. *peploides*), Fremont's cottonwood (*Populus fremontii*), Himalayan blackberry (*Rubus armeniacus*), and South American vervain (*Verbena bonariensis*). The disturbed/developed habitat consists mostly of impenetrable surfaces (i.e. paved), but includes species such a turkey mullein (*Croton setigerus*), ripgut brome, and Bermuda grass along the vegetated margins of these areas (ECORP 2015a).

Arborist Survey Results

A total of 134 trees with DBH of 6 inches or greater were inventoried during the survey within or along the project boundary. A list of all inventoried trees and their associated data are included in Appendix B. These included 7 blue oaks (*Quercus douglasii*), 34 interior live oaks, 7 valley oaks (*Quercus lobata*), 8 scarlet oaks (*Quercus coccinea*), 1 red oak (*Quercus rubra*), 5 Chinese hackberries (*Celtis sinensis*), 2 Aleppo pines (*Pinus halepensis*), 1 tulip tree (*Liriodendron tulipifera*), 3 crape myrtles (Lagerstroemia indicia), 1 western redbud (*Cercis occidentalis*), 1 white mulberry (*Morus alba*), 21 Oregon ashes, 3 pecans (*Cara illinoinesis*), 2 Chinese privets (*Ligustrum sinense*), 6 Fremont's cottonwoods, 23 willows (*Salix* sp.), 8 red alders (*Alnus rubra*), and 1 black walnut (*Juglans californica*). Tree locations were recorded with a GPS unit and mapped on an aerial photograph provided as a tree location map in Appendix B, Attachment C.

A subsequent survey was conducted on February 11, 2016 by ECORP biologist/ISA Certified Arborist Krissy Walker (No. WE-11308A) to collect information regarding three trees that were not identified during the first field survey. Two trees were inventoried with a DBH of 6 inches or greater including one Valley oak and one Fremont's cottonwood.

Wildlife

This project supports wildlife in all habitats, with the exception of the disturbed/developed areas which only support minimal wildlife movement. Species documented during the field visits included: Western fence lizard (*Sceloporus occidentalis*), house finch (*Haemorhous mexicanus*), turkey vulture (*Cathartes aura*) (dead), acorn woodpecker (*Melanerpes formicivorus*), western scrub-jay (*Aphelocoma californica*), mallard (*Anas platyrhynchos*), and Western gray and Eastern gray squirrels (*Sciurus griseus and S. carolinensis*) (ECORP 2015a).

Soils

Three soil types occur within the project site. These include: (142) Cometa-Ramona sandy loams, 1 to 5 percent slopes, (175) Ramona sandy loam, 2 to 9 percent slopes, and (194) Xerofluvents, frequently flooded (ECORP 2015a). Topography is sloped toward Dry Creek, which bisects the project site.

Potential Waters of the U.S.

Dry Creek and an ephemeral drainage, an unnamed tributary to Dry Creek, run through the middle of the project site (ECORP 2015a). Water was present in Dry Creek at the time of the survey, but the ephemeral drainage was dry. Dry Creek ultimately runs to the Sacramento River and therefore has a direct surface connection to existing Waters of the U.S. As such, this feature appears to be jurisdictional; however, the jurisdictional determination is ultimately the responsibility of the USACE (ECORP 2015a).

Special-Status Plants

Ten special-status plant species were identified as having the potential to occur in the project site and the vicinity based on the literature review (Appendix B, Table 1). However, upon further analysis and after the site visit, eight species were considered to be absent from the site due to the lack of suitable habitat or because the site is outside the range for the species. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining two species that have the potential to occur within the project site are presented below.

Big-scale balsamroot

Big-scale balsamroot (*Balsamorhiza macrolepis*) is not listed pursuant to either California Endangered Species Act (CESA) or federal Endangered Species Act (ESA); however, it is designated as a CRPR 1B.2 species. This species is sometimes found within serpentine soils in chaparral, cismontane woodland, and valley and foothill grassland habitats. Big-scale balsamroot is a perennial herb that flowers between the months of March and June and is known to occur at elevations ranging from 295 to 5,102 feet above MSL. Big-scale balsamroot is endemic to California; the current range of this species includes Alameda, Amador, Butte, Colusa, El Dorado, Lake, Mariposa, Napa, Placer, Santa Clara, Shasta, Solano, Sonoma, Tehama, and Tuolumne counties (ECORP 2015a).

The annual grassland habitat on the site is highly maintained and disturbed, which likely precludes the presence of this species. However, there is a limited amount of this habitat that is scattered throughout the site which may provide suitable habitat for the big-scale balsamroot. This species is sometimes found in serpentine soils which were not observed on-site. Therefore, the annual grassland provides marginal habitat for this species and it is considered to have a low potential to occur on-site.

Sanford's arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is not listed pursuant to either CESA or ESA, but is designated as a CNPS List 1B.2 species. This species is a perennial rhizomatous herb that occurs in marshes and swamps and assorted shallow freshwater. Sanford's arrowhead blooms from May through November and is known to occur from 0 to 2,133 feet above MSL (CNPS 2015). Sanford's arrowhead is endemic to California; the current range of this species includes Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Orange, Placer, Sacramento, San Bernardino, Shasta, San Joaquin, Solano, Tehama, Ventura, and Yuba counties (ECORP 2015a).

Marsh-like conditions present along any of the edges of the creek may provide suitable habitat for this species. However, there is low potential for this habitat to occur on the site. Sanford's arrowhead is considered to have low potential to occur on-site.

Special-Status Wildlife

Invertebrates

Six special-status invertebrate species were identified as having the potential to occur on the project site and the vicinity based on the literature review (Appendix B, Table 1). However, upon further analysis and after the site visits, these species were considered to be absent from the site due to lack of suitable habitat.

Fish

Three special-status fish species were identified as having potential to occur on the project site and the vicinity based on the literature review (Appendix B, Table 1). However, upon further analysis and after the site visit, one species, Delta smelt, was considered to be absent from the site due to lack of suitable habitat. No further discussion is provided in this analysis. A brief description of the Central Valley fall/late fall-run Chinook salmon and Central Valley Steelhead, which have potential to occur within the project site, is presented below.

Chinook Salmon (Central Valley fall/late fall-run ESU)

Chinook salmon (*Oncorhynchus tshawytscha*) have four distinct runs in the Sacramento-San Joaquin River Systems during each year. Of the four, the Central Valley fall/late-fall run is considered a species of special concern, while the winter run is considered endangered and the spring run is considered threatened. Habitat for Central Valley fall/late-fall run chinook salmon includes freshwater rivers and streams that are tributaries to the Sacramento and San Joaquin River systems as well as the rivers themselves. While the timing of runs vary from stream to stream, adult fall-run Chinook generally migrate upstream from July through December and spawn from early October through late December, and late fall-run Chinook generally migrate into the rivers from mid-October through December and spawn from January through mid-April. Spawning usually takes place in shallow riffles in suitable gravel deposits. The majority of young Central Valley fall/late-fall run migrate to the ocean during the first few months following emergence. Some, however, may remain in fresh water and migrate as yearlings. Central Valley fall/late fall-run Chinook salmon are known to utilize Dry Creek as upstream migrating adults and as downstream out-migrating juveniles. As such, this species is considered to potentially occur within the project area.

Steelhead (California Central Valley ESU)

Central Valley steelhead (*Oncorhynchus mykiss*) is listed as a federally threatened species and is also listed as threatened by the American Fisheries Society. Habitat for Central Valley steelhead includes freshwater rivers and streams that are tributaries to the Sacramento and San Joaquin River systems. The Central Valley steelhead run can occur from July through May and primarily occurs from December through April with peaks in September and February. Spawning takes place in shallow swift moving riffles with small gravel and cobble as the primary substrate needed for spawning. Young steelhead may spend from one to three years in freshwater prior to migrating to the ocean, with most fish emigrating during the spring when smoltification occurs. Emigrating Central Valley steelhead are known to use the lower reaches of the Sacramento River and the Delta for rearing and as a migration corridor to the ocean.

Critical Habitat for Central Velley steelhead occurs within the proposed project area. Critical Habitat was designated for Central Valley steelhead on 2 September 2005 (70 FR 52488) and includes all or portions of the following counties: Tehama, Butte, Glenn, Shasta, Yolo, Sacramento, Solano, Yuba, Sutter, Placer, Calaveras, San Joaquin, Stanislaus, Tuolumne, Merced, Alameda, and Contra Costa. In general, Critical Habitat includes the stream channels to the ordinary high water line within designated stream reaches of:

- the American (including Dry Creek), Feather, and Yuba rivers;
- the Deer, Mill, Battle, Antelope, and Clear creeks in the Sacramento River basin;
- the Calaveras, Mokelumne, Stanislaus, and Tuolumne rivers in the San Joaquin River basin;
- the Sacramento and San Joaquin rivers and
- the entire Delta.

Central Valley steelhead are known to utilize Dry Creek as upstream migrating adults and as downstream out-migrating juveniles. As such, this species is considered to potentially occur within the project area. Furthermore, construction of the project may adversely affect or modify designated Critical Habitat which occurs on site.

Reptiles

Two special-status reptile species (western pond turtle and giant garter snake) were identified as having the potential to occur in the project site and the vicinity based on the literature review (Appendix B, Table 1). However, upon further analysis and after the site visit, one species (giant garter snake) was considered to be absent from the site due to lack of suitable habitat. A brief description of western pond turtle, which has potential to occur within the project site, is presented below.

Western Pond Turtle

The western pond turtle (*Actinemys marmorata marmorata)* is not listed pursuant to either CESA or ESA; however, it is designated as a CDFG species of special concern. Western pond turtles occur in a variety of fresh and brackish water habitats including marshes, lakes, ponds, and slow moving streams (Jennings and Hayes 1994). This species is primarily aquatic; however, they typically leave aquatic habitats in the fall to reproduce and to overwinter (Jennings and Hayes 1994). Deep, still water with abundant emergent woody debris, overhanging vegetation, and rock outcrops is optimal for basking and thermoregulation. Although adults are habitat generalists, hatchlings and juveniles require specialized habitat for survival through the first few years. Hatchlings require shallow water habitat with relatively dense submergent or short emergent vegetation in which to forage.

Western pond turtles are typically active between March and November. Mating generally occurs during late April and early May and eggs are deposited between late April and early August (Jennings and Hayes 1994). Eggs are deposited within excavated nests in upland areas, with substrates that typically have high clay or silt fractions, usually in the vicinity of aquatic habitats (Jennings and Hayes

1994). The majority of nesting sites are located within 650 feet (200 m) of the aquatic habitat; however, sites have been documented as far as 1,310 feet (400 m) from the aquatic habitat. There is potential for western pond turtle to occur within the site along Dry Creek.

Birds

Twenty special-status bird species were identified as having the potential to occur in the project site and the vicinity based on the literature review (Appendix B, Table 1). However, upon further analysis and after the site visit, fourteen of these species were considered to be absent from the site due to lack of suitable habitat. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining six species that have the potential to occur or were seen during the site visit within the project are presented below.

Cooper's Hawk

The Cooper's hawk (*Accipiter cooperii*) is not listed pursuant to either CESA or ESA. However, it is a CDFW "watch list" species and is currently tracked in the CNDDB. Typical nesting and foraging habitats include riparian woodland, dense oak woodland, and other woodlands near water. Cooper's hawk nest throughout California from Siskiyou County to San Diego County, and includes the Central Valley (ECORP 2015a). Breeding occurs during March through August, with a peak from May through July. Cooper's hawk was observed on-site during the site visit.

White-tailed Kite

White-tailed kite (*Elanus leucurus*) is not listed pursuant to either CESA or ESA; however, the species is fully protected pursuant to Section 3511 of the California Fish and Game Code. This species is a common resident in the Central Valley and the entire length of the California coast, and all areas up to the Sierra Nevada foothills and southeastern deserts (ECORP 2015a). In northern California, white-tailed kite nesting occurs from February through early August, with activity peaking from March through June. Nesting occurs in trees within riparian, oak woodland, savannah, and agricultural communities that are near foraging areas such as low elevation grasslands, agricultural, meadows, farmlands, savannahs, and emergent wetlands (ECORP 2015a). The nearest documented white-tailed kite nest is within five miles of the project site (ECORP 2015a). White-tailed kite is considered to have potential to occur on-site.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species and is protected pursuant to CESA. This species nests in North America (Canada, western United States, and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta (ECORP 2015a). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawks nest within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel (*Otospermophilus beecheyi*), ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanopulus* species). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, disking, and irrigating (ECORP 2015a). The removal of vegetative cover by such farming activities results in more readily available prey items for this species.

The nearest documented Swainson's hawk nest is within five miles of the project site (ECORP 2015a). While there is suitable nesting habitat on-site, the site and surrounding area does not support suitable foraging habitat. Therefore, Swainson's hawk is considered to have low potential to occur on-site.

Nuttall's Woodpecker

The Nuttall's woodpecker (*Picoides nuttallii*) is not listed and protected under either CESA or ESA, but is considered a USFWS bird of conservation concern. They are resident from Siskiyou County south to Baja California. Nuttall's woodpeckers nest in tree cavities primarily within oak woodlands, but also can be found in riparian woodlands (ECORP 2015a). Breeding occurs during March through June. Nuttall's woodpecker was observed on-site during the site visit.

Yellow-billed Magpie

The yellow-billed magpie (*Pica nuttalli*) is not listed pursuant to either CESA or ESA but is considered a USFWS bird of conservation concern. This endemic species is a year-long resident of the Central Valley and Coast Ranges from San Francisco Bay to Santa Barbara County. Yellow-billed magpies build large, bulky nests in trees in a variety of open woodland habitats, typically near grassland, pastures or cropland. Nest building begins in late January to mid-February, and nest building may take up to six to eight weeks to complete (ECORP 2015a). The young leave the nest at about 30 days after hatching (ECORP 2015a). Yellow-billed magpies are highly susceptible to West Nile virus, which may have been the cause of death to thousands of magpies from 2004 to 2006 (ECORP 2015a). Yellow-billed magpie is considered to have potential to occur on-site.

Oak Titmouse

Oak titmice (*Baeolophus inornatus*) are not listed and protected under either CESA or ESA, but are considered a USFWS bird of conservation concern. Oak titmice are distributed throughout California, excluding the humid northwestern corner, the Great Basin region in the northeastern corner, and the deserts (ECORP 2015a). They are found in arboreal vegetation communities that are dominated by oak (*Quercus* species) trees, but may also occur in coniferous and other woodland habitats (ECORP 2015a). Oak titmouse was observed on-site during the site visit.

Mammals

Two special-status bat species were identified as having potential to occur in the project site and the vicinity based on the literature review (Appendix B, Table 1). Brief descriptions of the two species that have the potential to occur within the project site are presented below.

Pallid Bat

The pallid bat (*Antrozous pallidus*) is a large buff-colored bat, with large ears and broad wings (Orr 1954). The pallid bat occurs throughout the southwestern United States, south into Mexico, and along the Pacific states of California, Oregon, and Washington (ECORP 2015a). This species is found in a variety of habitats including grasslands and oak woodlands (Philpott 1996). This species typically roosts in rock crevices, tree hollows, or various man-made structures such as attics, barns, and bridges (Orr 1954, O'Shea and Vaughan 1977, Lewis 1994, Philpott 1996). Pallid bats are primarily insectivores and feed by gleaning prey items from the ground or off vegetation (ECORP 2015a). Pallid bat dormancy period ends in late March or early April. Pallid bats are gregarious in the spring and summer months, forming colonies of approximately 30-100 individuals. Females typically give birth in May and June to twins (mean of 1.8 young per female). Colony size decreases during the fall, and by October the bats move to winter locations.

The pallid bat is listed as a state species of special concern (ECOPR 2015a). In addition, the Western Bat Working Group (WBWG) has classified the pallid bat in California as "imperiled or are at high risk of imperilment" (ECORP 2015a). The main threats to this species are loss of oak woodland and other forest habitat, along with roost disturbance resulting in roost abandonment. The current state and WBWG status level reflects significant population declines occurring within the north Coast range. The status of the Central Valley pallid populations is not known. The pallid bat is considered to have potential to occur on-site within the trees and building on the site.

Townsend's Big-eared Bat

The Townsend's big-eared bat (*Corynorhinus townsendii*) occurs throughout California and is considered a cave obligate species. Although they will occasionally use a tree as a roost, this species prefers caves, mines, bridges, or buildings for roost sites. They are particularly sensitive to disturbance and may abandon a roost site permanently after only one slight human disturbance (e.g., humans walking into a cave or mine). Townsend's big-eared bats will roost alone or in groups of 15-100 individuals. They feed primarily on moths and prefer to forage along the edge of clumps of native vegetation. They are year-round residents in California and, while they hibernate during the winter, they do occasionally forage during the winter months (Kunz and Martin 1982, Philpott 1996).

The Townsend's big-eared bat is listed as a state candidate for potential listing as threatened (CDFW 2015). In addition, the WBWG has classified the Townsend's big-eared bat in California as "imperiled or are at high risk of imperilment" (WBWG 2015). The main threats to this species are closure of mines and caves, along with roost disturbance resulting in roost abandonment. Of all the bats in northern California, this one is considered the most imperiled. Townsend's big-eared bat is considered to have low potential to roost in the trees on-site.

Wildlife Movement Corridors

The project site is located within a riparian corridor between residential neighborhoods and is in close proximity to residences and human presence. While evidence of human presence is found throughout the area, including an existing paved bike trail, unpaved/unimproved walking and off-road bicycle trails and trash, the site is considered a wildlife movement corridor for a variety of terrestrial and aquatic wildlife species. Dry Creek provides a movement corridor for anadromous fish species such as Central Valley steelhead and fall run/late fall-run Chinook salmon, and allow for other aquatic species, such as native warm water fish species, river otters, and turtles to migrate through the project area. The construction footprint will be restored to pre-project conditions upon completion, so the project will result in temporary impacts to potential wildlife movement within the vicinity of the project.

4.4.2 Biological Resources (IV.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b)	Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c)	Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d)	Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e)	Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f)	Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				

a) ***Less than Significant with Mitigation Incorporated.*** As previously described in Section 4.4.1 Environmental Setting, three special-status birds were observed on the site during the site visit and there is suitable habitat or marginally suitable habitat within the project site for two special-status plants, two special-status fish, one special-status reptile, six special-status birds, and three special-status mammals. The Proposed Project could potentially adversely impact these species during construction. As described in the project description, in order to install the dual force mains, it would be necessary to temporarily de-water a segment of Dry Creek and divert flows through the project area. Additionally, the project would disturb oak woodland and riparian woodland habitat, requiring the removal of at least one oak tree and may indirectly impact up to 13 other trees. Implementation of **BMPs 1, 2, 3, 4, 6,** and **7** as described in Section 2.8 Environmental Commitments and **Mitigation Measure Bio-1** would reduce potentially adverse impacts to special-status species to a less than significant level.

BMP — 1: Conduct Environmental Awareness Training for Construction Personnel

BMP — 2: Install Construction Barrier Fencing to Protect Environmentally Sensitive Areas

BMP — 3: Retain a Biologist to Monitor Construction Activities in the Creek Corridor

BMP — 4: Avoid and Minimize Disturbance of Dry Creek and Associated Aquatic Habitat

BMP — 6: Conduct a Pre-Construction Survey for Western Pond Turtles and Implement Measures to Avoid Impacts

BMP —7: Construct Outside of Nesting Season or Conduct Pre-Construction Raptor Nesting Surveys

Mitigation Measure

Bio-1 Endangered Species Act Section 7 Consultation and Preparation of a Biological Assessment

To prevent take of any special-status fish species protected under ESA, the Applicant will consult with National Marine Fisheries Service (NMFS) pursuant to Section 7 of ESA. A formal Biological Assessment (BA) shall be prepared to address any potential adverse effects to federally listed fish species arising from implementation of the Proposed Project. This document will also address any effects on Critical Habitat and shall be submitted as part of the permitting process. The BA shall be the primary support document for ESA consultation and, once issued, the Proposed Project shall comply with all conditions of the Biological Opinion (BO) from NMFS. These conditions will include mitigation measures to minimize potential impacts to special status fish species such as the threatened Central Valley steelhead and to minimize activities that would adversely affect or modify Critical Habitat. These measures may include but are not necessarily limited to construction timing windows, dewatering structure installation procedures, implementation of erosion control and turbidity measures, training of construction crews, and on-site monitoring and reporting.

b) ***Less than Significant Impact.*** As described above in Section 4.4.1, the project site contains three plant communities including oak woodland with a ruderal annual grassland understory, riparian woodland, and disturbed/developed. As previously described in item a), installation of the new dual six-inch force mains would temporarily de-water a segment of Dry Creek and divert flows through the project area. Additionally, the project would disturb oak woodland and riparian woodland habitat, requiring the removal of at least one oak tree and may indirectly impact up to 13 other trees. Impacts would be temporary and the project site would be restored to pre-project conditions following completion of construction. The *City of Roseville's General Plan: Open Space and Conservation Element* identifies the protection of natural habitat areas such as creeks, riparian corridors and adjacent grassland areas as one of three primary goals. The implementation of all **BMPs (BMP — 1 through BMP — 10)**, as described in **Section 2.8 Environmental Commitments**, would ensure that sensitive natural communities would not be adversely impacted by the Proposed Project, that all temporarily disturbed areas are restored following construction, and any permanent impacts are appropriately mitigated via purchase of mitigation credits as required by the applicable resource agencies. Therefore, impacts to riparian and other sensitive natural communities would be **less than significant** and no additional mitigation is required.

BMP — 1: Conduct Environmental Awareness Training for Construction Personnel

BMP — 2: Install Construction Barrier Fencing to Protect Environmentally Sensitive Areas

BMP — 3: Retain a Biologist to Monitor Construction Activities in the Creek Corridor

BMP — 4: Avoid and Minimize Disturbance of Dry Creek and Associated Aquatic Habitat

BMP — 5: Minimize Potential for the Long-Term Loss of Mixed Riparian Forest

BMP — 6: Conduct a Pre-Construction Survey for Western Pond Turtles and Implement Measures to Avoid Impacts

BMP —7: Construct Outside of Nesting Season or Conduct Pre-Construction Raptor Nesting Surveys

BMP — 8: Restore all Temporarily Disturbed Areas and Comply with Agency Permitting Requirements to Mitigate Permanent Wetland and Riparian Impacts

BMP — 9: Avoid the Introduction or Spread of Noxious Weeds in the project Area

BMP — 10: Comply with Requirements of the Tree Preservation Chapter of the Roseville Zoning Ordinance

c) *Less than Significant Impact*. As previously described in section 4.4.1, Dry Creek and an ephemeral drainage runs through the project site. These features appear to be jurisdictional; however, the jurisdictional determination is ultimately the responsibility of the U.S. Army Corps of Engineers (USACE). Based on the Pre-Construction Notification Request for Authorization Under Nationwide Permit No. 12 (Utility Line Activities) prepared by ECORP, the project would result in temporary impacts to 0.192 acres of Waters of the U.S (see Figure 3. Waters of the U.S. in Appendix B).

Implementation of **BMP — 8** would ensure a **less than significant impact** would result from the construction of the Proposed Project.

BMP — 8: Restore all Temporarily Disturbed Areas and Comply with Agency Permitting Requirements to Mitigate Permanent Wetland and Riparian Impacts

d) *Less than Significant Impact with Mitigation Incorporated.* The Proposed Project would involve trenching across the channel bed of Dry Creek to install the dual force mains. As described previously in Section 4.4.1, Dry Creek provides a movement corridor for anadromous fish species such as Central Valley steelhead and fall run/late fall-run Chinook salmon, and allow for other aquatic species, such as native warm water fish species, river otters, and turtles to migrate through the project area. Central Valley fall/late fall-run Chinook salmon and Central Valley steelhead are known to utilize Dry Creek as upstream migrating adults and as downstream out-migrating juveniles. Habitat occurs within the project site for western pond turtles. Construction-related activities could temporarily impact wildlife movement within the vicinity of the project site; however, Implementation of **BMPs 1, 2, 3,**

4, 5, 6, and 8 and **Mitigation Measure Bio-1** as previously described in items a) and b), would ensure that the movement of wildlife species would not be inhibited during construction of the Proposed Project. Therefore, a **less than significant impact** would occur.

e) ***Less than Significant Impact***. As previously described in Section 4.4.1, an arborist survey was completed for the project site and included several native oak trees, with 6 inches or greater DBH, that are regulated under the City of Roseville Tree Ordinance. The Proposed Project would likely result in the removal of two regulated City native Valley oak tree, totaling 25.5 inches DBH, and may impact the protected zone radius of 13 additional City regulated native oak trees (four Valley oaks and nine interior live oaks), totaling 178 inches DBH. Implementation of **BMP — 10** would ensure compliance with the City of Roseville's Tree Preservation Ordinance per the City of Roseville Mitigation Ordinances, Guidelines, and Standards as described in Section 2.7.

The City will comply with the City's Tree Preservation Ordinance as applicable, including avoidance, minimization, or compensation for the removal or disturbance of native oak trees greater than 6 inches DBH during construction. If native oak trees will be affected by the project, the City will prepare a tree mitigation plan that identifies trees that qualify for protection and specifies mitigation for impacts. For any oak trees that would be removed, the City will mitigate the impact through either on-site planting or use of the City's in-lieu fee program.

Per the requirements of **BMP — 10**, the City would offset the loss of any oak tree through on-site planting or the use of the City's in-lieu fee program. Implementation of **BMP — 10** would ensure that impacts to native oak trees would be **less than significant**. No mitigation is required.

f) ***No Impact.*** There is no adopted Habitat Conservation Plan (HCP), Natural Conservation Community Plan (NCCP), or other approved local, regional, or state habitat conservation plan applicable to the Proposed Project (City of Roseville 2015; CDFW 2015). No mitigation is required.

4.5 Cultural Resources

4.5.1 Environmental Setting

A Cultural Resources Inventory Report was prepared by ECORP Consulting, Inc. (ECORP 2015b, Appendix C) for the Proposed Project to determine if cultural resources were present in or adjacent to the project area and assess the sensitivity of the project area for undiscovered or buried cultural resources. The cultural context of the project area including regional and local prehistory, ethnography, and regional and project area histories can be found in the report in Appendix C.

The analysis of cultural resources was based on a records and literature search conducted at the North Central Information Center (NCIC) of the California Historical Resources Information System at California State University-Sacramento on July 10, 2015, a literature review, and a field survey on July 10 and November 12, 2015. The literature search included the results of previous surveys within a 0.25-mile (400 meters) radius of the Proposed Project location.

A search of the Sacred Lands File by the Native American Heritage Commission (NAHC) showed no Native American cultural resources in the project area.

4.5.2 Cultural Resources (V.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b)	Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c)	Would the project disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

a) ***No impact*****.** The project area is in a developed area of the City of Roseville. The existing Shadowbrook Lift Station and pipeline crossing Dry Creek are less than 50-years in age, since they were constructed in 1981 and 1984. Therefore, they are not considered a Historical Resource under CEQA [CCR Title 14, Section 15064.5(a)] or a historic property under the NHPA. No Historical Resources that meet the criteria of significance under CEQA are located in the project area. Therefore, no impact would occur from the Proposed Project.

b) *Less than Significant with Mitigation Incorporated*. According to the cultural resources inventory report (ECORP 2015b, Appendix C), one archaeological isolate was identified within the project area as a result of the field survey. If the City of Roseville determines that the prehistoric isolate within the project Area is ineligible for the CRHR and, therefore, is not an Historical Resource for the purpose of CEQA, then no mitigation measures for the prehistoric isolate on the Shadowbrook property will be necessary under CEQA. However, the potential for unrecorded archaeological resources below the ground surface does exist. These resources may be disturbed during construction of the Proposed Project that would include trenching up to 12 feet in depth and approximately 3 to 5 feet in width. Impacts to unknown resources would be less than significant with the implementation of Mitigation Measure CR-1.

Mitigation Measure

CR-1 Unanticipated Discovery of Cultural Resources

If subsurface deposits believed to be cultural or human in origin are discovered during construction, then all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

A. If the professional archaeologist determines that the find does not represent a cultural resource, then work may resume immediately and no agency notifications are required.

B. If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, then he or she shall immediately notify the City of Roseville as the CEQA lead agency, and applicable landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to their satisfaction.

C. If the find includes human remains, or remains that are potentially human, then he or she shall ensure reasonable protection measures are taken to protect the discovery from disturbance (AB 2641). The archaeologist shall notify the Placer County Coroner (per §7050.5 of the Health and Safety Code). The provisions of §7050.5 of the California Health and Safety Code, §5097.98 of the California Public Resources Code, and Assembly Bill 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, then the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the project (Section 5097.98 of the Public Resources Code). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, then the NAHC can mediate (Section 5097.94 of the Public Resources Code). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

c) ***Less than Significant Impact with Mitigation Incorporated***. According to the cultural resources inventory report(ECORP 2015b, Appendix C), a search of the Sacred Lands File by the NAHC failed to indicate the presence of Native American cultural resources within the Proposed Project area. While there is no reason to suspect the presence of human remains in the project area, it is possible that currently unknown remains may occur. In the event that evidence of human remains is discovered, the requirements of Mitigation Measure CR-1 would be implemented. The Proposed Project would have less than significant impacts with the implementation of Mitigation Measure CR-1.

4.6 Geology and Soils

4.6.1 Environmental Setting

Geotechnical investigations were conducted for the project site in 2015 (BCI 2015; Appendix D) and are summarized in this section.

Geomorphic Setting

The Proposed Project site is in the central portion of the City of Roseville, in Placer County at the base of the Sierra Nevada foothills in northern California. The project site and surrounding area is underlain by the Mehrten Formation consisting of mudflow tuff breccia and volcanic derived sandstones within the Great Valley Geomorphic Province. The Great Valley is an alluvial plain, about 50 miles wide and 400 miles long, between the Coast Ranges and Sierra Nevada (DOC 2002).

Regional Seismicity and Fault Zones

An “active fault,” according to California Department of Conservation, Division of Mines and Geology, is a fault that has indicated surface displacement within the last 11,000 years. A fault that has not shown geologic evidence of surface displacement in the last 11,000 years is considered “inactive.”

Soils

Three soil types are located within the project Area as identified by the United States Department of Agriculture’s (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey website (NRCS 2015). These soils consist of Cometa-Ramona sandy loams, 1 to 5 percent slopes (142), Ramona sandy loam, 2 to 9 percent slope (175), and Xerofluvents, frequently flooded (194). The majority of the soil within the project Area consists of the Xerofluvents, frequently flooded located along the banks and terraces of Dry Creek, which is a somewhat poorly drained stratified loamy sand alluvium derived from granite and commonly found along terraces. The typical soil profile consists of loamy sandy from the surface to 37 inches below, and loam to silty clay between 37 and 55 inches below the surface. This soil occurs at elevations of 0 to 1500 feet, in a climate with mean annual rainfall of 14 to 20 inches, with warm dry summers and cool moist winters. The mean annual temperature is about 61 to 64 degrees Fahrenheit and the frost free season is 250 to 270 days. (NRCS 2015)

4.6.2 Geology and Soils (VI.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project expose people or structures to 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) Would the project result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		☒	☐	☐

d)	Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e)	Would the project 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?	☐	☐	☐	☒

a) i and ii) ***No Impact.*** The project area is not located in a Fault-Rupture Hazard Zone / Alquist-Priolo Earthquake Fault Zone. The risk of fault rupture within the site is low due to the absence of any known active faults in the vicinity. The nearest active fault is the Dunnigan Hills fault that is approximately 32 miles from the project site to the west in Yolo County (USGS 2006). The nearest fault classified as an Alquist-Priolo Earthquake Fault Zone is the Cleveland Hill fault located over 47 miles north of the project site south east of Oroville (BCI 2015). No impact would occur.

Additionally, site-specific geotechnical information prepared for the project would be incorporated into project design to ensure compliance with the applicable California Building Code (CBC) Seismic Design Parameters regulations for seismic safety as well as the City of Roseville Design and Construction Standards. No impact would occur.

a) iii) Liquefaction is a phenomenon where water-saturated granular soil loses shear strength during strong ground shaking produced by earthquakes. The loss of soil strength occurs as a consequence of cyclic pore water pressure increases below the groundwater surface. Potential hazards due to liquefaction include loss of bearing strength beneath structures, possibly causing foundation failure and/or significant settlements and differential settlements. Liquefaction generally occurs in areas where the ground water table is less than 50 feet below the surface.

According to the Roseville General Plan 2025, liquefaction in the City of Roseville is not specifically addressed in currently available risk data from the State Division of Mines and Geology or had a determination that liquefaction exists in the area. Historically liquefaction has not been a significant issue in the City. According to the geotechnical report (BCI 2015), the saturated sediment encountered in the borings were medium dense to dense and have a low risk for liquefaction. No impact would occur.

a) iv) The California Department of Conservation Landslide Inventory map (DOC 2015) was used to identify possible landslide problem areas. The City of Roseville is not within a landslide area and the project site is level with the exception of the creek channel and embankment. No impact would occur.

b) *Less than Significant Impact*. Implementation of BMP-4 and the Storm Water Pollution Prevention Plan (SWPPP) prepared for the Proposed Project and would minimize potential for erosion and the loss of topsoil during construction-related activities (see Hydrology and Water Quality (IX.) Environmental Checklist and Discussion). Soil erosion impacts would be reduced to a less than significant impact through implementation of BMPs identified by the City and included in the SWPPP.

c) *Less than Significant Impact with Mitigation Incorporated*. Native soils on-site do not have a high clay content therefore, the soils are stable and would not result in landslides, liquefaction or collapse (see item a) discussion above). Specific removal, fill and re-compaction recommendations are provided in the geotechnical evaluation. Impacts would be less than significant with implementation of Mitigation Measure GEO-1.

Mitigation Measure

GEO-1 Site Specific Geotechnical Design Recommendations

> The site-specific recommendations from the *Geotechnical Report, Shadowbrook Lift Station and Force Main, Roseville, California* prepared for the *Shadowbrook Lift Station and Force Main project* shall be followed during site design and construction.

d) ***No Impact***. According to the soil description in the Web Soil Survey, the native soils on-site do not have a high clay content therefore, the soils in the project site do not have the ability to be expansive. No impact would occur.

e) ***No Impact***. Septic tanks or alternative wastewater disposal systems are not part of the Proposed Project design. No impact would occur.

4.7 Greenhouse Gas Emissions

As previously noted in Section 4.3 Air Quality, an Air Quality Study, which includes an analysis of greenhouse gas emissions, was prepared for the Proposed Project by KD Anderson & Associates (KD Anderson 2015; Appendix A). The findings of the Air Quality Study addressing greenhouse gas emissions associated with the Proposed Project are summarized in this section.

4.7.1 Environmental Setting

The PCAPCD participated in a joint process with other air districts in the region to develop CEQA significance thresholds for GHG emissions. The Board of Directors of the SMAQMD adopted the GHG thresholds in October 2014. PCAPCD staff recommends use of the GHG emissions significance thresholds adopted by the SMAQMD (KD Anderson 2015). Project-related GHG emissions are considered a significant impact if the amount of emissions exceeds 1,100 metric tons per year (MT/yr) of short-term construction-related or long-term operational carbon dioxide equivalent (CO_2e) emissions.

If project-related GHG emissions exceed the thresholds listed above, the Proposed Project is considered to have a significant impact on GHG emissions, and measures to reduce or offset the GHG emissions should be considered. Measures that reduce the amount of GHG emissions to less than the thresholds are considered to reduce the impact to less than significant levels.

4.7.2 Greenhouse Gas Emissions (VII.) Environmental Checklist and Discussion

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

a) *Less than Significant Impact.*

Construction-related Emissions

GHG emissions were estimated using the Road Construction Emissions Model, and emissions conversion rates from the California Air Resources Board and U.S. Environmental Protection Agency. Construction of the Proposed Project would result in the following amount of GHG emissions during the construction period:

- 151.10 metric tons of carbon dioxide (CO_2),
- 0.01 metric tons of methane (CH_4), and
- 0.05 metric tons of nitrous oxide (N_2O).

Project construction activities would generate 151.16 metric tons of project CO_2e. Because this amount is less than 1,100 MT/yr significance threshold, this impact is considered less than significant. No mitigation measures are required.

Long-term Operational Emissions

As noted previously in Section 4.3, emissions associated with long-term operation of the Proposed Project would be primarily associated with use of electricity to operate the lift station pump, and the Proposed Project is not anticipated to result in additional demand for electricity compared to the existing lift station. As a result, the Proposed Project would not be expected to increase long-term operational emissions. Therefore, the long-term operational impact of GHG emissions is considered less than significant. No mitigation measures are required.

b) *Less than Significant Impact.* As previously described in Section 4.7.1, the PCAPCD staff recommends use of the GHG emissions significance thresholds adopted by the SMAQMD. Project-related GHG emissions are considered a significant impact if the amount of emissions exceeds 1,100 metric tons per year (MT/yr) of short-term construction-related or long-term operational carbon dioxide equivalent (CO_2e) emissions. The amount of GHG emissions described under item a) is less than 1,100 MT/yr significance threshold SMAQMD and therefore, the Proposed Project would not conflict with an applicable plan, policy or regulation adopted to reduce emissions of GHG emissions. A less than significant impact would occur. No mitigation measures are required.

4.8 Hazards and Hazardous Materials

4.8.1 Environmental Setting

The California Code of Regulations defines hazardous materials as substances with physical characteristics that could trigger a considerable present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed (CAL FIRE 2014). Hazardous materials are grouped into the following four categories, based on their characteristics:

A. Toxic – causes human health effects
B. Ignitable – has the ability to burn
C. Corrosive – causes severe burns or damage to materials
D. Reactive – causes explosions or generates toxic gases

If handled inappropriately, hazardous material and hazardous waste may result in public health hazards if discharged into the soil, groundwater, or become airborne through the release of vapors, fumes, or dust (CAL FIRE 2014). The California Code of Regulations, Title 22, Sections 66261.20-24 describes toxic characteristics that could cause soil or groundwater to be classified as hazardous waste (CAL FIRE 2014).The State agencies overseeing regulatory controls on hazardous materials are the California Environmental Protection Agency (Cal-EPA) and the Office of Emergency Services. The California Highway Patrol and California Department of Transportation (Caltrans) oversee and enforce regulations for hazardous materials transport (CAL FIRE 2014). The Department of Toxic substances Control (DTSC), a department within Cal-EPA, is the responsible authority for regulating hazardous materials and enforcement (CAL FIRE 2014). The Resource Conservation and Recovery Act (RCRA) regulates hazardous waste under the federal government and commonly refers to such materials as RCRA wastes. Hazardous wastes regulated under State of California laws are referred to as “non-RCRA” or “California only” wastes, which include certain metals such as copper, nickel, and zinc that are not regulated under RCRA (CAL FIRE 2014).

As part of the federal Disaster Mitigation Act (DMA; public Law 106-390), the City of Roseville has prepared and adopted the Roseville Hazard Mitigation Plan (RHMP) in an effort to proactively reduce future loss of life and property resulting from disasters (City of Roseville 2005; 2014). The RHMP identifies and describes hazard mitigation initiatives to effectively manage the following potential hazards:

- Drought hazard
- Earthquake hazard
- Flood hazard
- Landslide hazard
- Human Caused hazard
- Human Health hazard
- Severe Weather hazard
- Wildfire hazard
- Multiple Hazard

The RHMP was approved by the Federal Emergency Management Agency (FEMA), and requires that transport of materials must occur along designated truck routes and maintain appropriate clearances, using approved containers that are in compliance with the City's fire department protocols as described in Roseville Fire Code Ordinance 4594 (City of Roseville 2014). In addition, the City of Roseville Fire Department is a Certified Unified Program Agency (CUPA), available to respond to hazardous materials complaints or emergencies during the construction of projects for the City of Roseville (City of Roseville 2014).

4.8.2 Hazards and Hazardous Materials (VIII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b)	Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c)	Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d)	Would the project 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 for people residing or working in the project area?	☐	☐	☐	☒
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g)	Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
h)	Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

a) ***Less than Significant Impact.*** The Proposed Project would include the transport, short-term storage and use, and disposal of hazardous materials related to construction activities for the Proposed Project including site preparation, excavation, and installation of the new lift station and dual six-inch force mains. BMPs stipulating proper storage of hazardous materials and vehicle fueling would be implemented during construction and demolition as part of the Storm water Pollution Prevention Plan (SWPPP) and general construction permit. The City of Roseville and its contractors would follow all applicable federal, state, and local regulations, including Cal-OSHA and manufacturer instructions for the management, storage, and handling of hazardous materials and hazardous waste for the construction and operation and maintenance of the Proposed Project. Potentially adverse effects from the routine transport, use, and disposal of hazardous materials during the Proposed Project construction and operation and maintenance would be further reduced to a less than significant impact with implementation of **BMP — 4** described in Section 2.8 Environmental Commitments.

BMP — 4: Avoid and Minimize Disturbance of Dry Creek and Associated Aquatic Habitat

b) ***Less than Significant Impact.*** Hazardous materials, such as diesel fuel and oil, would be used during construction and operation and maintenance at the project site. The potential for release of any hazardous substance to the environment would be minimized through the implementation of BMPs listed in the SWPPP as required by the National Pollutant Discharge Elimination System (NPDES) Permit.

As stated above in item a), the City of Roseville and contractors would be responsible for disposal of all hazardous waste generated on-site and storage and handling of hazardous substances in accordance with applicable federal, state, and local regulations. Reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment associated with the Proposed Project construction and operation and maintenance would be less than significant with implementation of **BMP — 4** as described in Section 2.8 Environmental Commitments.

c) ***Less than Significant Impact.*** There are two schools within 0.25 mile of the project site; John Adams Academy located approximately 0.15 mile northeast of the project site and Roseville High School located approximately 0.22 mile northwest of the project site (City of Roseville 2015; Google 2015). As previously described in Section 4.8.1, permanent sources of hazardous materials associated with the Proposed Project would include diesel fuel, stored on-site for the proposed standby generator. All other sources of hazardous materials would be associated with construction activities and would involve the use of heavy equipment, which would contain fuels, oils, lubricants, solvents and various other possible contaminants. All hazardous materials, substances, or waste would be handled consistent with federal, state, and local regulations. As described in Section 4.3.2 Air Quality (III.) Environmental Checklist and Discussion the nature of the Proposed Project does not involve long-term operation of a stationary source of TACs; and therefore, would not expose sensitive receptors to any new sources of substantial pollutant concentrations. A less than significant impact would occur.

d) ***No Impact.*** After reviewing the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, there are no known hazardous sites within the immediate vicinity of the project site (DTSC 2015). Therefore, No Impact would occur.

e) ***No Impact.*** The project site is not located within an airport land use plan area, within two miles of an airport, or within the vicinity of a private airstrip (City of Roseville; Google Earth 2015). Therefore, no impact would occur.

f) ***No Impact.*** There are no private airstrips in the vicinity of the project area (City of Roseville 2015; Google 2015). No impact would occur.

g) ***No Impact***. The Proposed Project would consist of the replacement of the existing Shadowbrook Lift Station and force main and is not anticipated to generate an increase in normal traffic levels and would not result in any permanent road closures or affect existing emergency routes. The Proposed Project would not interfere with an adopted emergency response plan or emergency evacuation plan. No impact would occur.

h) ***No Impact.*** The Proposed Project site is located adjacent to residential development and open space zoned as a floodway. There are no wildlands in proximity to the site according to the California Department of Forestry and Fire Protection (CDFFP) Placer County Fire Hazard Severity Zone Map (CDFFP 2015). No Impact would occur.

4.9 Hydrology and Water Quality

4.9.1 Environmental Setting

Regional Hydrology

The project site is located within the Dry Creek Watershed, within the American River South Basin in the central portion of the Sacramento Valley and Sierra Nevada foothills in Placer County (Placer County 2014). The Dry Creek Watershed spans approximately 101 square miles and is comprised of six tributary watersheds including Antelope Creek, Cirby Creek, Linda Creek, Strap Ravine, Secret Ravine, and Miners Ravine. All tributaries eventually drain to the Sacramento River through the Natomas East Main Drainage Canal (Placer County 2014).

Site Hydrology and On-Site Drainage

An assessment of impacts to Dry Creek's regulatory floodplain was prepared for the Proposed Project by Storm Water Consulting, Inc. (SWC) (SWC 2015; Appendix E). SWC completed an investigation of the impacts of implementation of the Proposed Project upon base flood elevations (100-year flood, existing and future conditions) for Dry Creek, which runs through the Proposed Project site. The base floods that have been considered are for the existing development condition 100-year flood (FEMA) and the City's future, fully- developed, unmitigated (FFDU) 100-year flood. The FFDU base flood information assumes full build-out conditions of the upstream watershed per the General Plans from upstream agencies, without the benefit of peak flow mitigation from upstream development. The investigation included a literature search and field reconnaissance to support the assessment of impacts of the Proposed Project. A brief summary of the investigation results is presented below.

According to the “effective” and the more recent “preliminary” Flood Insurance Rate Maps covering the project site location and the FFDU floodplain map, the existing and Proposed Project are located outside of the 100-year Floodway, but inside of the 100-year Floodplain for Dry Creek (Exhibits A and B, Appendix E). By interpolation of base flood elevations shown on Exhibit B, the approximate FEMA elevation of the base flood affecting the project site is 154.3 feet. The FFDU floodplain map (Exhibit D) depicts a future base flood elevation of about 152.5 feet at NGVD 29 datum, which converts to about elevation 155.0 feet at NAVD 88 datum, when adjusted by +2.47 feet as cited in the preliminary Flood Insurance Study (FIS) from FEMA. According to the topographic mapping of the project site as supplemented by field reconnaissance, the existing project improvements are located on a “bench” or “shelf” at the edge of the floodplain and would have a maximum depth of flooding of about 2 feet during the existing condition 100-year flood and about 2.7 feet during the FFDU 100-year flood for Dry Creek. Just to the west of the bench area (location for upgraded lift station), the grade drops down several feet and into the effective flow conveyance area for Dry Creek. The actual Dry Creek channel is several additional feet lower and is located about 200 feet further to the northwest from the bench area. Flood profiles from the “effective” Flood Insurance Study indicate that the base flood for Dry Creek would have a depth of about 13 feet during the existing condition 100-year flood and about 9.5 feet during the existing condition 10-year flood, measured from the Dry Creek channel (see Exhibit C, Appendix E for further details depicting site elevations and features).

4.9.2 Hydrology and Water Quality (IX.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b)	Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c)	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d)	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a	☐	☐	☒	☐

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	manner that would result in flooding on- or off-site?				
e)	Would the project 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?	☐	☐	☒	☐
f)	Would the project otherwise substantially degrade water quality?	☐	☐	☒	☐
g)	Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h)	Would the project place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☒	☐
i)	Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j)	Would the project be subject to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

a) ***Less than Significant Impact.*** During construction of the Proposed Project, impacts to water resources could occur without proper controls to protect water quality and reduce impacts to soil erosion. Soil can be loosened during excavation, fill and grading, paving, and tree removal processes. Loosened soils and spills of fluids or fuels from construction vehicles and equipment or miscellaneous construction materials and debris could degrade surface and ground water quality. The majority of the precipitation for the area occurs during the winter months; however, adverse storm events can also occur outside of the winter. A heavy rainfall event could cause pollutants to flow into Dry Creek, which flows through the center of the project site.

The APE of the project site would be greater than one acre making the Proposed Project subject to the requirements of the statewide NPDES storm water permit for construction (Order 98-08-DWQ) and Construction Storm Water General Permit. As stated previously in Section 4.8, a SWPPP listing BMPs to prevent construction pollutants and products from violating water quality standards or waste discharge requirements would be required for the Proposed Project. Additionally, the Proposed Project would comply with the City of Roseville’s grading ordinance which requires an erosion control plan to eliminate off-site flows of sediment and to reduce on-site erosion to protect water quality in the City’s storm drain system (City of Roseville 2014).

As described in Section 2.5, in order to install the dual force mains, it would be necessary to temporarily de-water a segment of Dry Creek and divert flows through the project area. A containment dam would be established in conformance with City specifications and regulations, and as required by

CDFW and NOAA. The containment dam would be constructed within the channel banks within the project limits upstream, and possibly downstream, of the construction activities. The City would construct the creek diversion to isolate the work area from Dry Creek using one of four options (or equivalent, as may be approved by the agencies):

- Approximately 60 cubic yards of clean gravel material wrapped in a geofabric;
- A k-rail that is wrapped in a geofabric and backfilled with approximately 60 cubic yards of clean gravel;
- Bladders that are filled with creek water and placed within the creek channel; or
- Similar diversion structures placed upstream and possibly downstream; however, creek flow through the construction site would be piped rather than via an open, flowing channel. It is anticipated that the contractor would use backhoes and excavators from the upslope bank to install and remove the diversion.

The project would be required to comply with federal, state, and local regulations including preparation and implementation of a SWPPP, existing City ordinances, and **BMPs 4, 8, and 9** as described in Section 2.8 Environmental Commitments. Through implementation of **BMPs 4, 8, and 9** and compliance with federal and state Clean Water Act regulations, California Department of Fish and Game Code, and existing City ordinances, the City would ensure that during the construction of the Proposed Project no substantial erosion or siltation would occur within the project site. In addition, implementation of Bio-1 requiring ESA Section 7 consultation and preparation of a biological Assessment would have stringent water quality measures that would further ensure that the Proposed Project would not violate any water quality standards or waste discharge requirements. Therefore, a less than significant impact would occur. No mitigation is required.

BMP — 4: Avoid and Minimize Disturbance of Dry Creek and Associated Aquatic Habitat

BMP — 8: Restore all Temporarily Disturbed Areas and Comply with Agency Permitting Requirements to Mitigate Permanent Wetland and Riparian Impacts

BMP — 9: Avoid the Introduction or Spread of Noxious Weeds in the project Area

b) ***No Impact.*** The Proposed Project would consist of the replacement and upgrade of the existing lift station and force main. Water used for vegetation establishment after completion of construction would be minor and obtained from the existing surface City water supplies. The project site would be returned to pre-project conditions, and therefore would not substantially deplete groundwater supplies, or interfere substantially with groundwater recharge, or cause a lowering of the local groundwater table. No impact would occur.

c) ***Less than Significant Impact.*** The Proposed Project would consist of the replacement and upgrade of the existing lift station and force main. As described previously in Section 2.5 and item a) above, in order to install the dual force mains, it would be necessary to temporarily de-water a segment of Dry Creek and divert flows through the project area. Implementation of **BMPs 4, 8, and 9** as described in Section 2.8 Environmental Commitments, would prevent substantial erosion or siltation as a result of development of the Proposed Project.

Through implementation of **BMPs 4, 8, and 9** compliance with federal and state Clean Water Act regulations, California Department of Fish and Game Code, and existing City ordinances, the City would ensure that during the installation of the dual force mains, Dry Creek would not be altered in way that would result in substantial erosion or siltation. A less than significant impact would occur.

d) ***Less than Significant Impact.*** The Proposed Project would involve the replacement and upgrade of the existing lift station and force main. As described in Section 2.5, new dual six-inch force mains would be installed within a common trench, which would temporarily de-water a segment of Dry Creek and divert flows through the project area. Once construction is completed, the project site would be returned to pre-project conditions. The Proposed Project would not substantially alter the amount of surface runoff. In addition, implementation of **BMP — 4** as described in Section 2.8 Environmental Commitments, would ensure that surface runoff would remain minimal during construction of the Proposed Project. Therefore the project would not alter the existing drainage pattern or increase surface runoff in a manner that would increase on or off-site flooding. Related impacts are considered less than significant, no mitigation is required.

e) ***Less than Significant Impact.*** The Proposed Project would consist of the replacement and upgrade of the existing lift station and force main. As described above, new dual six-inch force mains would be installed within a common trench, which would temporarily de-water a segment of Dry Creek and divert flows through the project area. Through the CWA Section 401 and 404 permitting processes, the City would coordinate with the necessary regulatory agencies in order to ensure compliance. The Proposed Project would not increase the amount impervious surfaces on-site and would not increase the amount of runoff from the project site. Implementation of temporary BMPs during construction and the long-term operational BMPs as part of compliance with the NPDES Permit and **BMPs 4, 8, and 9** as described above in items a) and c) would prevent the increase of surface runoff and would prevent erosion and sedimentation. The Proposed Project would not exceed the capacity of the existing storm water drainage systems. A less than significant impact would occur.

f) ***Less than Significant Impact.*** See discussion under item a), Section 4.8.2 Hazards and Hazardous Materials (VIII) Environmental Checklist and Discussion regarding potential hazardous substances used on-site. The Proposed Project would follow all state and federal regulations regarding discharge of effluent, including preparation and implementation of a SWPPP, and would not discharge any materials or substances that may degrade water quality into any water bodies. Implementation of **BMPs 4, 8, and 9** as described above in Section 2.8 Environmental Commitments would ensure that a less than significant impact would occur.

g) ***No Impact.*** The project site is located within a FEMA-designated 100-year Flood Zone (Appendix E). However, the Proposed Project would not involve residential development and would not place housing in special flood hazard areas. Therefore, No Impact would occur.

h) ***Less than Significant Impact.*** Although the Proposed Project site is located within a FEMA-designated 100-year Flood Zone (SWC 2015), it would not result in a significant impediment to flood flows. As described above in Section 4.9.1, SWC has completed an investigation of the impacts of implementation of the Proposed Project upon base flood elevations (100-year flood, existing and future conditions) for Dry Creek, which runs through the Project site. Implementation of the Proposed Project would include the placement of about 81 cubic yards of fill, limited to the bench area between the existing 10-year and 100-year flood elevations, and 135 cubic yards of fill limited to the bench area between the FFDU 10-year and 100-year flood elevations. Supported by the literature search review and field reconnaissance, it was determined that the bench area where upgrades to the existing lift station would be completed is an “ineffective flow” or “nonconveyance” shallow ponding area during the occurrence of the existing condition and FFDU base floods in Dry Creek; therefore, the Proposed Project would not create any rise in flood levels during the passage of these base flood events. The volume of fill is considered to be insignificant from the standpoint of possible impacts caused by reductions in overbank storage during major flood events along Dry Creek. As described in Appendix E, the following was considered in concluding that a less than significant impact would occur:

- The topographic orientation of the elevated bench area within the edge of the floodplain and outside of the main conveyance area for flood flows in Dry Creek.
- The orientation of the bench area between two existing condominium buildings on each side of said area.
- Existing trees and shrubbery that separate the bench area from areas that are subject to deeper flooding within the Dry Creek Floodplain.
- The minimal depth of inundation flooding for the bench area (less than 2 feet FEMA and less than 2.7 feet FFDU).
- Site features that increase the hydraulic roughness of the bench area under existing conditions (such as an existing storage shed, the existing pump station enclosure, and appurtenant structures).

As described in Appendix E and the information presented above, a detailed hydraulic modeling effort for the Dry Creek base flood is not warranted for the Proposed Project, as it would be ineffective in quantifying the precise impacts of such a minimal floodplain modification and would not alter the conclusions provided herein.

In addition to the placement of fill, as described in Section 2.5, new dual six-inch force mains would be installed within a common trench, which would temporarily de-water a segment of Dry Creek and divert flows through the project area. Once construction is completed, the project site would be returned to pre-project conditions. A less than significant impact would occur.

i) ***Less than Significant Impact.*** As described above in Section 4.9.1, the existing and Proposed Project sites are located outside of the regulatory Floodway, but inside of the 100-year Floodplain for Dry Creek. Although the project site is within a designated flood inundation area, the project would not result in any increased risk. Supported by the assessment prepared by SWC, it was determined that the lift station is located on a bench area, which is an “ineffective flow” or “nonconveyance” shallow ponding area during the occurrence of the existing condition and FFDU base floods in Dry Creek; and therefore, the Proposed Project would not create any rise in flood levels during the passage of the base flood and would not result in any increased risk. The nature of the Proposed Project would not involve the construction of occupied structures; and therefore, no substantial risk of loss, injury, or death in the event of flooding at the project site would result with the implementation of the Proposed Project. A less than significant impact would occur.

j) ***No Impact.*** The Proposed Project site is located inland and not within a seiche, tsunami, or mudflow hazard area. Therefore, the Proposed Project would not be subject to inundation by seiche, tsunami, or mudflow. No impact would occur.

4.10 Land Use and Planning

As described previously, the project site is designated High Density Residential (HDR) and Low Density Residential (LDR) by the City of Roseville’s General Plan and is zoned as Attached Housing (R3) and Floodway (FW) by the City of Roseville Zoning Code (City of Roseville 2015). The project site is located on approximately 4.5 acres and is bound by Shadowbrook Apartment complex and Harding Boulevard (Blvd) to the east; Shadowbrook Apartment complex, high density residential development, and the Dry Creek Floodway to the south; low density residential development to the west; and the Dry Creek Floodway to the north and low density residential development to the northwest (Figure 3). See Section 2.2 for Representative Site Photographs.

4.10.2 Land Use and Planning (X.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project physically divide an established community?	☐	☐	☐	☒
b)	Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c)	Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

a) ***No Impact.*** As described in Section 2.2, the majority of the 4.5-acre project site is characterized by mixed oak woodland and riparian vegetation communities, with Dry Creek transecting the project site adjacent to the Miners Ravine Trail. The project site extends northwest to East Street and west to Parry Street. A low-density residential development is located on the northwest side of East Street. The existing lift station is located on an irregularly shaped bench adjacent and west of the Shadowbrook Apartments complex between Shadow Ridge Road and Dry Creek. The Proposed Project would replace the existing lift station and force main and would not physically divide an established community. No impact would occur.

b) ***No Impact.*** The project site is designated within the City of Roseville General Plan as High Density Residential (HDR) and Low Density Residential (LDR). The project site is zoned as Attached Housing (R3) and Floodway (FW). The surrounding land uses adjacent to the project site share the same land use designations and zoning with the exception of the floodway. The Proposed Project would remain consistent with the land use and zoning designation of the site. There would be no impact due to a conflict with a land use policy. No mitigation is required.

c) ***No Impact.*** As previously described in Section 4.4.2 item f), there is no adopted Habitat Conservation Plan (HCP), Natural Conservation Community Plan (NCCP), or other approved local, regional, or state habitat conservation plan applicable to the Proposed Project (City of Roseville 2015; CDFW 2015). No mitigation is required.

4.11 Mineral Resources

4.11.1 Environmental Setting

The Surface Mining and Reclamation Act of 1975 requires all cities and counties to incorporate the mapped mineral resource designations approved by the State Mining and Geology Board, in their General Plans. These designations categorize land as Mineral Resource Zones. However, according to the City of Roseville General Plan, mineral resources, consisting of sand and gravel, are limited and no mineral extraction operations currently exist or are anticipated to exist within the City limits (City of Roseville 2015).

4.11.2 Mineral Resources (XI.) Environmental Checklist and Discussion

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

a) ***No Impact.*** As stated above in Section 4.11.1, mineral resources, consisting of sand and gravel, are limited and no mineral extraction operations currently exist or are anticipated to exist within the City limits (City of Roseville 2015). No known mineral resources would be affected by the Proposed Project. Therefore, no impact would occur.

b) ***No Impact.*** The project area is not located within a current locally-important mineral resource recovery site designated on a local general plan, specific plan or other land use plan, and there is no evidence that the site has been historically mined (City of Roseville 2015). No impact would occur.

4.12 Noise

4.12.1 Environmental Setting

A Noise Assessment was completed for the Proposed Project by j.c. brennan & associates (j.c. brennan 2015; Appendix F). The Noise Assessment evaluated the Proposed Project's potential to produce noise related impacts. For further information, including a description of applicable federal, state, and local noise standards, see Appendix F.

Noise Background

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective. Often, someone's music is described as noise by another.

The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dBA to measure sound (j.c. brennan 2015). Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dBA, and changes in levels (dBA) correspond closely to human perception of relative loudness. The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dBA apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound (j.c. brennan 2015).

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise (j.c. brennan 2015).

The day/night average level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment (j.c. brennan 2015).

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual’s past experiences with noise

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it (j.c. brennan 2015).

Table 2. Typical Noise Levels lists several examples of maximum noise levels associated with common noise sources.

Table 2. Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	--60--	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: j.c. brennan 2015

Existing Noise Environment project Vicinity

The project area noise environment is a typical suburban environment with the primary noise sources being roadway traffic, distant construction and typical neighborhood activities, including playground activities.

To quantify existing ambient noise levels in the vicinity of the project site, j.c. brennan & associates, Inc., conducted continuous 24-hour noise measurements on the project site, and short-term noise measurements in the vicinity of the site (see Figure 1, Appendix F for noise measurement locations) (j.c. brennan 2015). The noise level measurements were conducted on July 21 and 22, 2015. The noise level measurements were conducted to determine typical existing background noise levels and for comparison to the project noise levels. A summary of the results of the continuous hourly ambient noise survey are shown in Table 2, Appendix F.

Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person’s perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating (j.c. brennan 2015).

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities (j.c. brennan 2015). Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Vibration criteria developed by Caltrans indicate that the threshold for damage to structures ranges from 2 to 6 in/sec. One-half this minimum threshold or 1 in/sec ppv is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur it notes as 0.1 in/sec ppv (j.c. brennan 2015).

4.12.2 Noise (XII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b)	Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c)	Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d)	Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
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 expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

a) ***Less than Significant Impact with Mitigation Incorporated.*** The Proposed Project would involve the replacement and upgrade of the existing lift station and force main. The following evaluates the construction and operational impacts of the Proposed Project.

Construction Impacts

Construction noise would be the primary contributor to short-term noise impacts from the Proposed Project. Construction activities associated with the project would result in temporary noise level increases. Any adverse reaction to the noise levels is expected to be minimal based upon time of day, duration and overall noise amplitudes (j.c. brennan 2015). Maximum noise levels associated with typical construction equipment activities are shown in **Table 3. Typical Construction Equipment Maximum Noise Levels** below.

Table 3. Typical Construction Equipment Maximum Noise Levels

Type of Equipment	Predicted Noise Levels, Lmax dB				Distances to Noise Contours (feet)	
	Noise Level at 50’	Noise Level at 100’	Noise Level at 200’	Noise Level at 400’	70 dB Lmax contour	65 dB Lmax contour
Backhoe	78	72	66	60	126	223
Compactor	83	77	71	65	223	397
Compressor (air)	78	72	66	60	126	223
Concrete Saw	90	84	78	72	500	889
Dozer	82	76	70	64	199	354
Dump Truck	76	70	64	58	100	177
Excavator	81	75	69	63	177	315
Paver	85	79	73	67	283	503
Concrete Mixer	79	73	67	61	141	249
Jackhammer	89	83	77	71	446	792
Pneumatic Tools	85	79	73	67	281	500

Source: Roadway Construction Noise Model User’s Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006. j.c. brennan & associates, Inc. 2015.

As part of the noise assessment prepared for the Proposed Project, the Federal Highway Administration Roadway Noise Construction Model was used to model noise level data for each type of noise source and percentage of use during a typical hour (j.c. Brennan). The noise levels associated with construction activities were evaluated for varying distances from the construction areas. **Table 4. Predicted Construction Noise Levels** shows the results of the predicted construction noise levels at distances of 100-feet, 200-feet and 400-feet. This assumes the four primary pieces of construction equipment operating simultaneously.

Table 4. Predicted Construction Noise Levels

Equipment	Construction Noise Levels		
	@ 100 feet	@ 200 feet	@ 400 feet
Backhoe	67.6 dBA Leq	61.5 dBA Leq	55.5 dBA Leq
Front End Loader	69.1 dBA Leq	63.1 dBA Leq	57.1 dBA Leq
Concrete Mixer Truck	68.8 dBA Leq	62.8 dBA Leq	56.8 dBA Leq
Dozer	71.7 dBA Leq	65.6 dBA Leq	59.6 dBA Leq
	75.6 dBA Leq	69.6 dBA Leq	63.5 dBA Leq

Source: Roadway Construction Noise Model User’s Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006. j.c. brennan & associates, Inc. 2015.

Sections 9.24.030 (G) and 9.24.140 of the City of Roseville noise ordinance exempts the project construction noise from the noise level criteria, provided that the construction occurs between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday; provided, however, that all construction equipment shall be fitted with factory installed muffling devices and all construction equipment shall be maintained in good working order (j.c. brennan 2015). With incorporation of Mitigation Measures N-1, impacts resulting from excessive generation of noise levels in excess of established standards during construction would be reduced to a less than significant level.

Mitigation Measures

N-1 Construction Noise Limits

A. Construction occurs between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday;

B. All construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.

Operational Impacts

Pumps associated with the lift station would be submersible pumps located in wet wells that would operate through electricity power and turn on/off when needed. j.c. brennan & associates, Inc. conducted noise level measurements of the existing submersible pumps on July 28, 2015. Noise level measurements were conducted with pumps operating and with the pumps off. The observations indicated that they were not audible. The noise level measurements indicated that the overall measured noise levels did not change with the pumps running. Pump operations are not expected to be audible when operating (j.c. brennan 2015).

The Proposed Project would install a new standby diesel generator with a sound enclosure. The noise level associated with the standby generator can vary based upon the size (kW) of the generator, and the sound enclosure level. The project proposes a Kohler Power System which includes a 15-30REOZK Generator with a factory sound enclosure. The factory noise level cutsheet indicates a sound level of 64 dBA at a distance of 7 meters (23-feet). The standby generator would operate under two scenarios as follows:

- The generator would operate during periods when a power failure occurs. Under this scenario, Section 9.24.030 (F) of the City noise ordinance would exempt the operations from the noise level standards.
- The generator would also be exercised, for maintenance purposes, approximately every two weeks for a period of approximately 15 minutes. The nearest residences are approximately 100 feet from the emergency generator. Assuming that the generator is exercised for 15 minutes, the hourly Leq would be 45 dBA, and would comply with the City of Roseville daytime noise level standard. Under this scenario, Section 9.24.030 (E) of the City noise ordinance would exempt the operations from the noise level standards. In addition, it is expected that the new generator will produce noise levels which are less than the existing generator which is currently on-site.

To ensure that the Proposed Project would operate within all applicable noise standards, Mitigation Measure N-2 shall be implemented.

Mitigation Measures

N-2 Emergency Diesel Generator Operation Noise Limits

A. The emergency generator may be exercised between the hours of 8:00 a.m. and 5:00 p.m.

B. The emergency generator shall be equipped with a sound enclosure which will reduce noise levels consistent with the Kohler Power System which indicates a sound level of 64 dBA at a distance of 7 meters (23-feet).

Implementation of Mitigation Measures N-1 and N2 would ensure compliance with applicable noise standards during construction and operation of the Proposed Project. A less than significant impact would occur.

b) ***Less than Significant Impact.*** The City of Roseville Municipal Code and General Plan Noise Element do not contain standards for evaluating vibration levels (j.c. brennan 2015). The following evaluates the construction and operational vibration impacts of the Proposed Project.

Construction Vibration Impacts

As described previously in Section 4.12.1, vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface (j.c. brennan 2015). Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. As discussed earlier, vibration criteria developed by Caltrans indicate that the threshold for damage to structures ranges from 2 to 6 in/sec. One-half this minimum threshold or 1 in/sec ppv is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur is noted as 0.1 in/sec ppv (j.c. brennan 2015).

Table 5. Vibration Levels for Varying Construction Equipment shows the typical vibration levels produced by construction equipment.

Table 5. Vibration Levels for Varying Construction Equipment

Type of Equipment	Peak Particle Velocity @ 25 feet	Approximate Velocity Level @ 25 feet
Large Bulldozer	0.089 (inches/second)	87 (VdB)
Loaded Trucks	0.076 (inches/second)	86 (VdB)
Small Bulldozer	0.003 (inches/second)	58 (VdB)
Auger/drill Rigs	0.089 (inches/second)	87 (VdB)
Jackhammer	0.035 (inches/second)	79 (VdB)
Vibratory Hammer	0.070 (inches/second)	85 (VdB)
Vibratory Compactor/roller	0.210 (inches/second)	94 (VdB)

j.c. brennan & associates, Inc. 2015

Based upon the distances to the nearest residential receivers, it is not expected that vibration due to construction would result in human annoyance or architectural damage. Therefore, a less than significant impact would occur.

c) ***Less than Significant Impact.*** The Proposed Project involves the replacement and upgrade of the existing lift station and force main. As described previously in item a), the noise level of the pumps at the existing lift station did not change when the pumps were running as opposed to being turned off. The same result is expected for the pump operations following lift station rehabilitation. In addition, the Proposed Project would also install a new standby diesel generator with a sound enclosure. Implementation of Mitigation Measure N-2 would ensure that no substantial permanent increase in ambient noise levels would occur within the project vicinity. A less than significant impact would occur.

d) ***Less than Significant Impact***. Construction of the Proposed Project would result in a temporary increase in ambient noise levels in the project vicinity. However, as discussed under item a), construction would be temporary and only occur during daytime hours. Additionally, the implementation of Mitigation Measure N-1 and N-2 would reduce impacts associated with a temporary increase in ambient noise levels. A less than significant impact would occur.

e) ***No Impact.*** The project site is not located within an airport land use plan or within two miles of a public airport (City of Roseville 2015). The Proposed Project would not expose people residing or working in the project area to excessive noise levels. No impact would occur.

f) ***No Impact.*** As described in Section 4.8 Hazardous and Hazardous Materials (VIII) Environmental Checklist and Discussion, item f), there are no private airstrips in the vicinity of the project area (City of Roseville 2015). The Proposed Project would not expose people residing or working in the project area to excessive noise levels. No impact would occur.

4.13 Paleontological Resources

4.13.1 Environmental Setting

A geotechnical investigation report was prepared for the project site in 2015 (BCI 2015 and Appendix D). During the investigations it was discovered that the geomorphology formation was actually Mehrten Formation instead of Upper Riverbank Formation as mapped (BCI 2015). The project site and surrounding area is underlain by the Mehrten Formation consisting of mudflow tuff breccia and volcanic derived sandstones within the Great Valley Geomorphic Province.

4.13.2 Paleontological Resources (XIII.) Environmental Checklist and Discussion

a) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporated ☒	Less than Significant Impact ☐	No Impact ☐

According to the geotechnical investigation (BCI 2015), the depth of the Mehrten Formation is at approximately 135 feet in elevation. A review of existing literature on paleontological resources of Placer County and the Mehrten Formation reveal that this formation is known to contain vertebrate fossils.

“The Mehrten Formation of Tertiary age is exposed in Placer County. Although there are no records of fossils in this unit in Placer County, UCMP has 277 records of vertebrate fossils from the Mehrten Formation in other northern California counties. Fossils found in this unit include horse, mastodon, bony fish, saber-toothed cat, rodent, reptile, and camel. The Mehrten Formation contains significant fossils which aid in interpreting late Miocene uplift of the Sierra Nevada mountain ranges, the life during this time, climate and environment of deposition. This unit is therefore considered sensitive for paleontological resources.” (SACOG 2015)

The project is anticipated to include trenching into the Mehrten formation. However, impacts to paleontological resources would be less than significant with the implementation of Mitigation Measure P-1.

Mitigation Measure

P-1 Unanticipated Discovery of Paleontological Resources

In the event that any fossil materials are encountered during ground-disturbing project-related activities, all activities must be suspended in the vicinity of the find and the City of Roseville shall be notified immediately. A Qualified Professional Paleontologist shall be obtained and empowered to halt or divert ground-disturbing activities. A plan for monitoring and fossil recovery must be completed and implemented before ground-disturbing activities can recommence in the area of the fossil find to allow for the recovery of the find. Recovered fossils shall be analyzed to a point of identification and curated at an established accredited museum repository with permanent retrievable paleontological storage. A technical report of findings shall be prepared with an appended itemized inventory of identified specimens and submitted with the recovered specimens to the curation facility.

4.14 Population and Housing

4.14.1 Environmental Setting

The Proposed Project site is located within the City of Roseville, Placer County, California. According to the U.S. Census Bureau, the City of Roseville had a total population of approximately 128,615 people in 2014, an approximately 8.4 percent increase from the last population census in April 2010 (U.S. Census Bureau 2015).

As described in Section 2.2, the eastern portion of the project site is located within the Shadowbrook Apartment complex. The existing Shadowbrook Lift Station is located on an irregularly shaped bench adjacent and west of the Shadowbrook Apartment complex between Shadow Ridge Road and Dry Creek. The center of the project site is characterized by mixed oak woodland and riparian vegetation communities, with Dry Creek transecting the project site adjacent to the Miners Ravine Trail. The project site extends northwest to East Street and west to Parry Street. A low-density residential development is located on the northwest side of East Street.

4.14.2 Population and Housing (XIV.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b)	Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c)	Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a) ***No Impact.*** The Proposed Project would involve the replacement and upgrade of the existing lift station and force main. The project does not propose any new homes or businesses. The Proposed Project would not directly or indirectly induce population growth because the sewer shed served by the project is built out and the project does not involve extension of roads or infrastructure into previously undeveloped areas. Therefore, no impact would occur.

b) ***No Impact.*** The Proposed Project would involve the replacement and upgrade of an existing lift station and force main. No displacement of existing housing and/or the construction of replacement housing elsewhere would be required. No impact would occur.

c) ***No Impact.*** See discussion under item b). No impact would occur.

4.15 Public Services

4.15.1 Environmental Setting

Police Services

The City of Roseville Police Department (RPD) is headquartered at 1051 Junction Blvd and provides the primary law and traffic enforcement within the city limits (City of Roseville 2015). There is currently no formal staffing standard for the RPD; however, the RPD's goal is to maintain a sworn staffing level of approximately 1.2 sworn officers per 1000 population, and supporting staff as needed to meet community needs (City of Roseville 2015).

Fire Services

The City of Roseville's fire department provides primary fire protection services within the City limits. There are eight existing fire stations and two planned fire stations as of 2012 (City of Roseville 2015). The closest fire station to the Proposed Project is located approximately 0.75 mile southwest at 401

Oak Street. The fire department maintains a front line fire apparatus fleet consisting of staffed engines, aerial ladder trucks, wildland engines, a hazardous materials response vehicle, a technical rescue vehicle, and command vehicles. In addition, the fire department maintains reserve vehicles and one engine dedicated to the Fire Training Center (City of Roseville 2015).

Schools

There are four school districts serving elementary and high school students within the City of Roseville's planning area which include Roseville City School District, Dry Creek Joint Elementary School District, Eureka Union School District, and Center Joint Unified School District (City of Roseville 2015). Several public and private schools are located within one mile of the project site. John Adams Academy is located approximately 0.15 mile northeast; Roseville High School is located approximately 0.22 mile northwest; Adelante High School is located approximately 0.40 mile southwest; Spanger Elementary School is located approximately 0.65 mile west; and Woodbridge Elementary is located approximately 0.99 mile from the project site (City of Roseville 2015; Google 2015).

Parks

There are City-owned parks and recreation facilities distributed throughout the City of Roseville's planning area, as well as recreational open space (City of Roseville 2015; Google 2015). Roseville's park and recreation facilities are operated by the City of Roseville Parks, Recreation, and Libraries Department. The Department is responsible for management, development, and maintenance of the City's various recreational facilities including parks, public golf courses and open space areas, as well as, providing an assortment of recreation programs to residents (City of Roseville 2015). The closest parks to the project site is William Taylor Park located directly adjacent to Miners Ravine Trail and the project site along the southwestern boundary; and Lincoln Estates Park also located adjacent along the western boundary of the project site (City of Roseville; Google 2015). A description of the City of Roseville's parks and recreational facilities are discussed in Section 4.15 Recreation.

Other Public Facilities

There are no public facilities located within the immediate vicinity of the project site; however, there are several facilities located approximately 0.70 mile southwest of the project site including Roseville City Hall, City of Roseville Main Library, Carnegie Library, and the local Cable Studio Channel 8 (City of Roseville 2015).

4.15.2 Public Services (XV.) Environmental Checklist and Discussion

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

a) ***No impact.*** The Proposed Project would involve the replacement and upgrade of the existing lift station and force main. There would be no increase in population as a result of the Proposed Project that would require increased staffing of the City of Roseville's police and fire departments or construction of new schools, parks, or public facilities to serve the project. Therefore, no impact would occur.

4.16 Recreation

4.16.1 Environmental Setting

As stated previously in Section 4.15 Public Services, the City of Roseville has many recreational sites including recreational open space, and formally developed parks and recreation facilities. "Park lands" is defined by the City of Roseville to include public developed parks, recreational open space and joint-use park-school facilities. As described in the City of Roseville's Parks and Recreation Element, the City has adopted the standard of securing 9 acres of park land per 1,000 residents.

Active and Passive Park Lands

The General Plan defines park lands into two main categories: traditional "active" park and non-traditional "open space or passive" park lands. Traditional "Active" parks refer to park sites that provide a variety of active facilities for City residents including ball fields, multi-use turf areas, hard court areas, and picnic and play areas (City of Roseville). This category is split amongst three subcategories which include: Neighborhood, Neighborhood/ School Parks, and City-wide/Community (Regional) parks. Non-traditional "open space or passive" park Lands refer to open space areas such as vernal pool preserves, oak woodlands, watershed/riparian areas, and greenbelts. Open space, vegetated areas may be used as passive recreational areas for visual and aesthetic enjoyment. Furthermore, such areas may accommodate bikeway or other trail connections such as Miners Ravine Bike Trail which crosses directly through the western portion of the project.

Other Recreational Facilities

According to the City of Roseville General Plan, there are currently four existing golf courses in the City of Roseville including the privately owned Sierra View County Club and Sun City Golf Course, and the publicly owned Diamond Oaks Golf Course and Woodcreek Golf Club. There are numerous private recreation facilities in Roseville consisting of primarily fitness/racquet clubs, recreation areas in multi-family developments, or other commercial recreation businesses such as entertainment centers or water parks. Although these facilities are important to enhancing recreation, the City focuses its policies on public facilities that do not limit access to residents which include many traditional active parks that are multi-disciplinary (City of Roseville 2015). Bicycle and pedestrian paths are addressed in the Circulation Element of the General Plan as their main purpose is to provide movement throughout the City. Miners Ravine Trail, which crosses the project site, is a part of the overall Bicycle Master Plan as specified in the Bikeway/Trails component of the Parks and Recreation Element (City of Roseville 2015).

As described in Section 4.15 Public Services, there are two parks located in proximity to the project site including William Taylor Park located directly adjacent to Miners Ravine Trail and the project site along the southwestern boundary; and Lincoln Estates Park also located adjacent along the western boundary of the project site (City of Roseville; Google 2015). As mentioned previously, Miners Ravine Bike Trail crosses the western portion of the project site.

4.16.2 Recreation (XVI.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
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?	☐	☐	☐	☒

a) ***No Impact.*** The Proposed Project would consist of the replacement and upgrade of the existing lift station and force main. The population would not increase as a result of the project; and therefore, use of the existing neighborhood, regional parks, or other recreational facilities would not change from the current use. During installation of the new dual force mains, a portion of Miners Ravine Bike Trail would be temporarily closed to ensure safety of pedestrians and cyclists during construction. A detour route would be created to allow continued use of the bike trail during construction (see Figure 4.) As such, the Proposed Project would not increase the use of existing recreational facilities that could cause substantial physical deterioration of the facilities. Therefore, no impact would occur.

b) ***No Impact.*** See discussion under item a). The Proposed Project would consist of the replacement and upgrade of the existing lift station and force main. No recreational facilities are proposed as part of the project. No impact would occur.

4.17 Transportation/Traffic

4.17.1 Environmental Setting

Access to the project site is provided at the intersection of Shadow Ridge and Harding Boulevard or along the western boundary at either East Street or Parry Street. Highway access is provided by Interstate 80 via Atlantic Street driving from the east or Douglas Boulevard driving from the west.

Levels of Service

Traffic operations are evaluated by determining the Level of Service (LOS), a qualitative ranking system which classifies road segments and intersections by progressively worsening traffic conditions. A roadway segment or intersection is assigned a grade, "A through F," with LOS A representing the least amount of traffic congestion with either little or no delay and LOS F representing total breakdown of traffic operations. The City of Roseville General Plan Circulation Element states that LOS D is the applicable minimum design standard; however, the overall LOS policy goal is to provide a LOS "C" or better at 70 percent of the signalized intersections during the PM Peak Hour. The closest major intersection to the entrance to the Shadowbrook Apartment Complex is Lead Hill Boulevard and Harding Boulevard, which currently operates at LOS A (City of Roseville 2015). All other roadways in the vicinity of the project area are not arterial streets that have been designated an LOS level.

4.17.2 Transportation/Traffic (XVII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b)	Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c)	Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e)	Would the project result in inadequate emergency access?	☐	☐	☐	☒
f)	Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐

a) ***Less than Significant Impact.*** The Proposed Project would generate short-term construction-related vehicle trips. During construction of the proposed lift station, workers would access the work site on a daily basis using the entrance to the Shadowbrook Apartment Complex located east of the project site at the intersection of Shadow Ridge and Harding Boulevard. During construction of the proposed dual six-inch force mains, workers would access the project site from Parry or East Street via the Miners Ravine Trail located west of the project site (see Figure 4. of Section 2.5). Construction of the Proposed Project would be scheduled between June 2016 and October 2016. Depending upon the construction phase (site preparation/grading or construction of structures), up to six construction workers would be present during construction activities. Construction workers would generate up to 12 vehicle trips a day in addition to an estimated two vehicle trips per day for transporting construction supplies. The Proposed Project would involve the replacement and upgrade of the existing lift station and force main and would not require regular maintenance for long-term operation.

As described previously in Section 2.5 project Characteristics, a portion of the Miners Ravine Trail, a multi-use path for cyclists, pedestrians, and non-motorized vehicles, transects the project area and would need to be closed during construction. The City of Roseville would provide notice of the trail closure at least two weeks in advance by posting notices near the closure of the trail, on the City's website, and through the City's Trail Alert email subscription. Additionally, a detour map would be posted at each end of the trail closure to direct trail users to an alternate route (see Figure 4.) until construction is complete. If necessary, the trail would need to be re-constructed to current width (11 feet in width not including the trail shoulder) and meet the design/construction standards for the trail (i.e. striping). The City's Public Works Department would require an inspection of the trail after reconstruction is complete. These project features would ensure that existing pedestrian and bicycle traffic in the project area would not be adversely affected during the construction of the proposed in improvements.

Therefore, the Proposed Project would not result in any substantial changes to the existing transportation system, and would not impede any transportation improvements or control measures. Construction of the Proposed Project would not substantially increase the current traffic patterns within the vicinity of project site and would not conflict with the circulation elements of the City of Roseville (City of Roseville 2015) and the Placer County General Plan (Placer County 2012). A less than significant impact would occur.

b) ***Less than Significant Impact.*** The Proposed Project would generate a temporary increase in traffic from construction which would end at the completion of construction activities. No long-term operations and maintenance is required. The Proposed Project would not permanently increase traffic in the project area therefore it would not affect LOS standards and travel demand measures for designated roads or highways in the project area. A less than significant impact would occur.

c) ***No Impact.*** The Proposed Project would not result in a change in air traffic patterns. No impact would occur.

d) ***No Impact.*** The Proposed Project would not substantially increase hazards due to a design feature. The Proposed Project would involve the replacement and upgrade of an existing lift station and force main located on City property. No roadway modifications are proposed as part of the project. No impact would occur.

e) ***No Impact.*** As described above in Section 4.17.1, the eastern portion of the project site is located within the Shadowbrook Apartment Complex, extending east to the intersection of Rocky Pointe and Shadow Ridge Roads (Figure 3). Equipment storage and parking during construction would be located adjacent to the Shadowbrook Apartments off of Rocky Pointe. The Proposed Project would not prohibit or alter emergency access to the Shadowbrook Apartment complex. No impact would occur.

f) ***Less than Significant Impact.*** See discussion under item a). During construction of the Proposed Project, traffic could increase during construction, but would be temporary. In addition, a portion of the Miners Ravine Trail, a multi-use path for cyclists, pedestrians, and non-motorized vehicles, transects the project area and would need to be closed during construction; however, the City of Roseville would provide a detour map to direct trail users to an alternate route and notice the public of the trail closure at least two weeks in advance by posting notices near the closure of the trail, on the City's website, and through the City's Trail Alert email subscription. These project features would ensure that existing pedestrian and bicycle traffic in the project area would not be adversely affected during the construction of the proposed in improvements.

The Proposed Project would not conflict with public transportation programs, plans, or policies. A less than significant impact would occur.

4.18 Tribal Cultural Resources

4.18.1 AB 52 Consultation Requirements

AB 52 consultation requirements went into effect on July 1, 2015 for all projects that have not already published a Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration, or published a Notice of Preparation of an Environmental Impact Report (Section 11 [c]). Because this project did not meet that threshold, the provisions for AB 52 consultation apply. However, as stipulated in Public Resources Code Section 21080.3.1(b), the lead agency shall begin consultation only when a California Native American tribe requested to the lead agency, in writing, to be informed through formal notification of proposed projects and when the tribe, after being noticed, responds within 30 days to indicate its desire to consult on the specific project.

Tribal Cultural Resources within Project Area

No Tribal Cultural Resources have been identified within or adjacent to the project site.

4.18.2 Tribal Cultural Resources (XVIII.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project cause a substantial adverse change in the significance of a Tribal Cultural Resource as defined in §21074?	☐	☒	☐	☐

a) ***Less Than Significant Impact with Mitigation Incorporated***. The existing Shadowbrook Lift Station and pipeline crossing Dry Creek was constructed in 1981 and 1984. The project area is in a developed area of the City of Roseville. There are no known Tribal Cultural Resources identified (as defined in Section 21074) within the Proposed Project site.

The City of Roseville received a written letter on November 23, 2015 from the United Auburn Indian Community (UAIC) of the Auburn Rancheria requesting formal notice of and information on proposed projects for which the City of Roseville will serve as the lead agency under CEQA. This request letter serves to initiate tribal consultation under AB 52; and therefore the City of Roseville is responsible for compliance with all applicable requirements under this statute.

The City sent a subsequent consultation request letter in response to the UAIC dated December 17, 2015. Copies of the letters and the certified mail receipt showing the date of the City's letter received by the UAIC are appended as Appendix G. As shown in Appendix G, the City's letter was received by UAIC on December 21, 2015 and therefore a response from UAIC to the City should have been received by January 21, 2016. No response has been received to date and therefore the City's consultation requirements for this project under AB 52 have been fulfilled.

The Proposed Project would not cause a substantial adverse action to a known Tribal Cultural Resource. Impacts to unknown Tribal Cultural Resources would be less than significant with Mitigation Measure CR-1.

4.19 Utilities and Service Systems

4.19.1 Environmental Setting

Water Service

The City of Roseville receives its water from the Federal Central Valley project, owned and operated by the United States Bureau of Reclamation (USBR). The City also contracts with the Placer County Water Agency (PCWA) and the San Juan Water District (SJWD) to receive an additional 34,000 acre-feet of water per year for municipal and industrial purposes (City of Roseville 2015). Where feasible, certain areas within the City limits may be supplied by either San Juan Water District or Placer County Water Agency to deliver adequate water supply throughout the community. The City of Roseville water treatment plant is located on Barton Road, south of Douglas Boulevard and east of the City limits. The water treatment plant has capacity to treat up to 100 million gallons/day (mgd) of raw water delivered from its source at Folsom Lake (City of Roseville 2015). Pump stations are located near East Roseville

Parkway and North Sunrise Avenue, as well as off Fairway Drive to provide sufficient water pressure to the higher elevations of the City and lift water into storage reservoirs (City of Roseville 2015).

Wastewater

There are two regional wastewater treatment plants that serve the City of Roseville: the Dry Creek wastewater treatment plant (WWTP) located on the southwestern edge of the City at 1800 Booth Road and the Pleasant Grove WWTP located west of the City at 5051 Westpark Drive (City of Roseville 2015). These WTPs are owned and operated by the City of Roseville along with Regional Partners consisting of the South Placer Municipal Utility District and portions of unincorporated Placer County. In addition, a small portion of the City service area flows to the Sacramento Regional Sanitation District and is treated at the Sacramento Regional Wastewater Treatment Plant (City of Roseville 2015).

The Proposed Project site is located in the service area of the Dry Creek WWTP, which is rated for an Average Dry Weather Flow (ADWF) of 18 million mgd and 45 mgd Peak Wet Weather Flow (PWWF). According to the City of Roseville General Plan Public Facilities Element, the Dry Creek WWTP is currently operating at 60% of rated flow capacity (City of Roseville 2015).

Solid Waste

The Western Placer Waste Management Authority is responsible for providing solid waste management to the City of Roseville, Rocklin, Lincoln, and unincorporated areas of Placer County (City of Roseville 2015; 2014). Placer County oversees the operation of the Western Regional Sanitary Landfill (WRSL) located at the southwest corner of Athens Road and Fiddyment Road which serves the western portion of the Placer County, including Roseville. Hazardous materials are currently transported to Class I landfills outside Placer County (City of Roseville 2015). Collection of solid waste within the City is operated and managed by Roseville's Environmental Utilities Department, Solid Waste Utility (City of Roseville 2015).

4.19.2 Utilities and Service Systems (XIX.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b)	Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☒	☐	☐
c)	Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e)	Would the project result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f)	Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g)	Would the project comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

a) ***No Impact.*** The Proposed Project would involve the replacement and upgrade of the existing lift station and force main. The waste shed served by these facilities is built out and the improvements would not increase the capacity for conveyance of wastewater beyond existing conditions. The Proposed Project would not generate an increase in population and would not have an adverse effect on wastewater treatment requirements. No impact would occur.

b) ***Less than Significant Impact with Mitigation Incorporated.*** The Proposed Project would be replacing and upgrading an existing lift station and force main. As described in Section 4.4 Biological Resources, construction of the proposed new dual force mains could potentially adversely affect two special-status plants, two special-status fish, one special-status reptile, six special-status birds, and three special-status mammals; however, with incorporation of Mitigation Measure Bio-1, and Proposed Project **BMPs 1 through 10** as described in Section 2.8 Environmental Commitments, impacts would be reduced to a less than significant level.

BMP — 1: Conduct Environmental Awareness Training for Construction Personnel

BMP — 2: Install Construction Barrier Fencing to Protect Environmentally Sensitive Areas

BMP — 3: Retain a Biologist to Monitor Construction Activities in the Creek Corridor

BMP — 4: Avoid and Minimize Disturbance of Dry Creek and Associated Aquatic Habitat

BMP — 5: Minimize Potential for the Long-Term Loss of Mixed Riparian Forest

BMP — 6: Conduct a Pre-Construction Survey for Western Pond Turtles and Implement Measures to Avoid Impacts

BMP —7: Construct Outside of Nesting Season or Conduct Pre-Construction Raptor Nesting Surveys

BMP — 8: Restore all Temporarily Disturbed Areas and Comply with Agency Permitting Requirements to Mitigate Permanent Wetland and Riparian Impacts

BMP — 9: Avoid the Introduction or Spread of Noxious Weeds in the project Area

BMP — 10: Comply with Requirements of the Tree Preservation Chapter of the Roseville Zoning Ordinance

c) ***No Impact.*** As previously described in Section 4.9 Hydrology and Water Quality, the project site would be returned to pre-project conditions and no changes to on-site stormwater runoff are anticipated as a result of implementation of the Proposed Project. No construction of new stormwater infrastructure or the expansion of existing infrastructure would be required for project operation. No Impact would occur.

d) ***Less than Significant Impact.*** City water may be required to support the revegetation of Dry Creek after installation of the new dual force mains is complete. The existing water supplies on-site would be sufficient to temporarily irrigate regrowth of vegetation. The project would not result in the need for new or expanded water supplies. A less than significant impact would occur.

e) ***No Impact.*** See discussion under item a). The Proposed Project would not be population growth-inducing and would not increase the demand of the existing wastewater treatment provider. No impact would occur.

f) ***Less than Significant Impact.*** As described above in Section 4.18.1 Environmental Setting, the Material Recovery Facility and the Western Regional Sanitary Landfill operated by Western Placer Waste Management Authority is responsible for handling recycling and waste disposal for the City of Roseville and surrounding communities (City of Roseville 2015; 2014). Construction of the Proposed Project would generate construction debris and excavated soil. Construction is scheduled to be completed over a five month period. No recycling or waste disposal would be required for operation and maintenance of the Proposed Project and therefore would not affect landfill capacity because the amount of construction debris requiring disposal would be minor and would only occur during the construction period.

g) ***Less than Significant Impact.*** As identified in the City of Roseville's Design and Construction Standards for solid waste (Section 151), the City would ensure that the contractors prepare a work plan to store and dispose of all construction debris in accordance with applicable federal, state, and local regulations. This plan would be approved by the designated Roseville Environmental Utilities inspector prior to the commencement of work (City of Roseville 2014). Therefore, a less than significant impact would occur.

4.20 Mandatory Findings of Significance

4.20.1 Mandatory Findings of Significance (XX.) Environmental Checklist and Discussion

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

a) ***Less than Significant Impact with Mitigation Incorporated.*** As stated previously in Section 4.4, Biological Resources, with implementation of MM Bio 1 and the Proposed Project BMPs (see section 2.8 Environmental Commitments) the Proposed Project would result in a less than significant impact on the habitat of a fish or wildlife species or population, on any plant or animal community, and would not restrict the range of a rare or endangered plant or animal. Furthermore, as stated above in Section 4.5, Cultural Resources and Section 4.13, Paleontological Resources, with the implementation of proposed Mitigation Measures (CR-1 and P-1), development of the Proposed Project would not result in significant impacts to Cultural or Paleontological Resources.

b) ***Less than Significant Impact.*** Project impacts would not be cumulatively considerable. No mitigation is required relevant to potential cumulative impacts.

For natural resource subjects (Aesthetics, Agriculture and Forest Resources, Biological Resources, Cultural Resources, Geology and Soils, Hydrology and Water Quality, and Mineral Resources), there would be no cumulative effects because all impacts would be less than significant or would be reduced to less than significant with mitigation incorporated. The Proposed Project would consist of the replacement and upgrade of an existing use and the site would be returned to pre-project conditions after completion of construction. In addition, the project would temporarily involve minimal hazardous materials use associated with construction and would not result in a cumulative effect on the environment.

The nature of the Proposed Project would not induce population growth or result in the development of new housing or employment-generating uses. Therefore, the Proposed Project would not result in a cumulative effect regarding increased demand or expansion for services or utilities.

c) ***Less than Significant Impact with Mitigation Incorporated.*** Direct and indirect impacts to human beings would be less than significant with the implementation of mitigation measures listed in this Initial Study.

SECTION 5. LIST OF PREPARERS

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Design Engineer

Candido Ramirez
Thomas Grau

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SECTION 7. LIST OF APPENDICES

APPENDIX A

Air Quality/Climate Change Technical Report

KD Anderson & Associates, Inc.
Transportation Engineers

October 29, 2015

Mr. Chris Stabenfeldt, AICP
Senior Environmental Planner/Project Manager
ECORP Consulting, Inc.
2525 Warren Drive, Rocklin, CA 95677

Subject: ***Shadowbrook Lift Station and Force Main Project Air Quality Emissions Modeling***

Dear Mr. Stabenfeldt:

On behalf of KD Anderson & Associates (KDA), I am pleased to submit this letter report presenting the results of air quality emissions modeling of the Shadowbrook Lift Station and Force Main Project (Proposed Project). This air quality report presents a description of the project, the methods used in the emissions modeling, and the results of the emissions modeling.

PROJECT DESCRIPTION

The original components of the existing Shadowbrook Lift Station, primarily consisting of the wet well/valve vault structure and the force main, are more than 30 years old. The Proposed Project involves rehabilitation of the existing Shadowbrook Lift Station to improve its resiliency to sewer system overflows. The following describes the components, location, construction characteristics, and operational effects of the Proposed Project.

Project Components

The Proposed Project would involve installation of a new fiberglass wet well within the existing pump station steel wet well, thereby occupying the same footprint.

Additionally, the Proposed Project includes installation of new dual six-inch force mains to connect from the lift station to the existing 63-inch Dry Creek Interceptor sewer line located on the west side of the creek. The purpose for the second force main is to provide system redundancy rather than capacity for future sewage flows (the sewer shed is built out). The new dual force mains would be approximately 370 feet in length and would consist of ductile iron pipe with ceramic epoxy lining.

The existing lift station is not equipped with a standby generator, instead requiring mobilization and connection of a portable generator during an electric utility outage. As part of the Proposed Project, the footprint for the existing concrete working pad would be extended to provide a secured area for a permanently mounted on-site standby generator. The expansion area would be immediately adjacent to the existing lift station facility and overlay an area which is currently occupied by the concrete pad. The reconstructed lift station would cover an area of approximately 4,000 square feet which is larger than the existing facility.

Project Location

The Proposed Project is located approximately 0.25 mile west of Interstate 80 between Dry Creek and the Shadowbrook Apartments, west of the Harding/Lead Hill Boulevard intersection, Roseville, Placer County, California (see the enclosed Figure 1, Project Location).

The eastern portion of the site is located within the Shadowbrook Apartments complex, extending east to the intersection of Rocky Pointe and Shadow Ridge Roads (see the enclosed Figure 2, Surrounding Land Uses). The existing Shadowbrook Lift Station is located on an irregularly shaped bench adjacent to and west of the Shadowbrook Apartments complex between Shadow Ridge Road and Dry Creek.

Project Construction

Construction of the Proposed Project is scheduled to occur between June 2016 and October 2016 and include, but not be limited to, the following standard construction equipment: excavator, wheel loader, backhoe, three-axle (dump) truck, portable compactor, and foreman truck. Up to six construction workers would be present during construction activities. Additionally, a crane and boom truck would be necessary for installation of the clear water diversion.

Operational Effects

The Proposed Project includes replacement of the existing Shadowbrook Lift Station pumps with new units of the same size. The firm capacity provided by the existing pumps exceeds the projected peak wet weather flow projected for the lift station. Therefore, replacement of the existing pumps with new units of the same size and keeping the existing pumps as un-installed backups is appropriate. Based on information provided by project engineers Hatch Mott McDonald, the new units of the same size included in the Proposed Project are not anticipated to result in additional demand for electricity compared to the existing lift station.

Air pollutant emissions associated with long-term operation of the Proposed Project would be primarily associated with use of electricity to operate the lift station pumps. As noted immediately above, the Proposed Project is not anticipated to result in additional demand for electricity compared to the existing lift station. Therefore, the Proposed Project is not expected to increase long-term operational emissions. Because the Proposed Project is not expected to increase long-term operational emissions, this letter report focuses on short-term construction-related emissions.

METHODOLOGY

The project site is located in the jurisdiction of the Placer County Air Pollution Control District (PCAPCD). Methods used in the air quality analysis of the Proposed Project are consistent with methods recommended in the PCAPCD document *CEQA Air Quality Handbook – Assessing and Mitigating Air Quality Impacts Under CEQA*. As recommended in the *CEQA Air Quality Handbook*, construction-related emissions associated with the Proposed Project were estimated using the Sacramento Metropolitan Air Quality Management District (SMAQMD) Road Construction Emissions Model.

The Road Construction Emissions Model is a spreadsheet-based model specifically designed to estimate emissions associated with construction of roadway facilities and other linear projects. The model uses basic project information (e.g., total construction months, project type, total project area) to quantify exhaust emissions from heavy-duty construction equipment, haul trucks, and worker commute trips, as well as fugitive particulate matter dust.

Information on the type and amount of construction equipment expected to be used in constructing the Proposed Project was provided by project engineers Hatch Mott McDonald. This project-specific information was used in the Road Construction Emissions Model, replacing model-provided default data.

Additional information on the Road Construction Emissions Model is available at the SMAQMD internet website (http://www.airquality.org/ceqa/index.shtml).

SIGNIFICANCE THRESHOLDS

The following describes significance thresholds applied in this letter report.

Criteria Pollutant Significance Thresholds

The Proposed Project site is located in the jurisdiction of the PCAPCD. Portions of the PCAPCD area are within three air basins. The Proposed Project site is within the Sacramento Valley Air Basin (SVAB) portion of the PCAPCD. The SVAB portion of the PCAPCD is located within the Sacramento region non-attainment area for federal ozone standards. The PCAPCD, along with other local air districts in the Sacramento region, are required to comply with and implement the State Implementation Plan (SIP) to demonstrate when and how the region can attain the federal ozone standards. Accordingly, the SMAQMD prepared the *Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan* in December 2008, with input from the other air districts in the region. The SMAQMD, Feather River Air Quality Management District (FRAQMD); El Dorado County Air Quality Management District (EDCAQMD); Yolo-Solano Air Quality Management District (YSAQMD); and PCAPCD adopted the Plan. The California Air Resources Board (CARB)

KDA

determined that the Plan meets Clean Air Act requirements and approved the Plan on March 26, 2009 as a revision to the SIP.

To evaluate ozone and other air pollutant emissions, the PCAPCD has established significance thresholds for emissions of ozone precursors reactive organic gases (ROG) and nitrogen oxides (NO_x), inhalable particulate matter less than 10 microns in diameter (PM_{10}), and carbon monoxide (CO). Significance thresholds used in this report are from the PCAPCD *CEQA Air Quality Handbook* and PCAPCD staff.

As a California Environmental Quality Act (CEQA) lead agency, the City of Roseville uses the PCAPCD significance thresholds listed in the enclosed Table 1 as air quality standards in the evaluation of air quality impacts associated with proposed development projects. The thresholds are:

- 82 pounds per day (ppd) of ROG,
- 82 ppd of NO_x,
- 82 ppd of PM_{10}, and
- 550 ppd of CO.

If the Proposed Project's emissions exceed the above pollutant thresholds, the project would be considered to have a potentially significant effect on regional air quality and the attainment of federal and State Ambient Air Quality Standards.

Greenhouse Gas Significance Thresholds

The PCAPCD participated in a joint process with other air districts in the region to develop CEQA significance thresholds for GHG emissions. The other air districts were the SMAQMD, EDCAQMD, FRAQMD, and YSAQMD. The Board of Directors of the SMAQMD adopted the GHG thresholds in October 2014. PCAPCD staff recommends use of the GHG emissions significance thresholds adopted by the SMAQMD. The SMAQMD GHG significance thresholds are applied in this report.

Project-related GHG emissions are considered a significant impact if the amount of emissions exceeds 1,100 metric tons per year (MT/yr) of short-term construction-related or long-term operational carbon dioxide equivalent (CO_2e) emissions.

If Project-related GHG emissions exceed the thresholds listed above, the Proposed Project is considered to have a significant impact on GHG emissions, and measures to reduce or offset the GHG emissions should be considered. Measures that reduce the amount of GHG emissions to less than the thresholds are considered to reduce the impact to less than significant levels.

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EMISSIONS ESTIMATES

The following describes the results of the emissions modeling analysis and the significance of air quality impacts.

Construction-Related Criteria Pollutant Emissions

Implementation of the Proposed Project would result in construction activity, which would generate air pollutant emissions. Construction activities such as grading, excavation and travel on unpaved surfaces would generate dust, and can lead to elevated concentrations of PM_{10}. The operation of construction equipment results in exhaust emissions, which include ozone precursors ROG and NO_x, and CO.

The enclosed **Table 2** shows estimates of criteria pollutant emissions associated with construction of the Proposed Project. The Road Construction Emissions Model output reports, showing the criteria pollutant emissions estimates, are enclosed. Construction of the Proposed Project would result in:

- 3.2 ppd of ROG,
- 33.90 ppd of NO_x,
- 6.90 ppd of PM_{10}, and
- 19.90 ppd of CO.

Project-related construction emissions of ROG, NO_x, PM_{10}, and CO would be below significance thresholds. Therefore, the impact of the project on these criteria pollutant emissions is considered less than significant. No mitigation measures are required.

Greenhouse Gas Emissions

GHG emissions were estimated using the Road Construction Emissions Model, and emissions conversion rates from the California Air Resources Board and U.S. Environmental Protection Agency. Construction of the Proposed Project would result in the following amount of GHG emissions during the construction period:

- 151.10 metric tons of carbon dioxide (CO_2),
- 0.01 metric tons of methane (CH_4), and
- 0.05 metric tons of nitrous oxide (N_2O).

The amounts of GHG emissions listed above would result in construction of the Proposed Project generating 167.38 metric tons of CO_2e. Because this amount is less than 1,100 MT/yr significance threshold, this impact is considered less than significant. No mitigation measures are required.

KDA

The Road Construction Emissions Model output reports, showing GHG emissions estimates, are enclosed.

Operational Emissions

As noted earlier in this report, emissions associated with long-term operation of the Proposed Project would be primarily associated with use of electricity to operate the lift station pump, and the Proposed Project is not anticipated to result in additional demand for electricity compared to the existing lift station. As a result, the Proposed Project is not expected to increase long-term operational emissions. Therefore, the long-term operational impact on both criteria pollutant emissions and GHG emissions is considered less than significant. No mitigation measures are required.

CLOSING

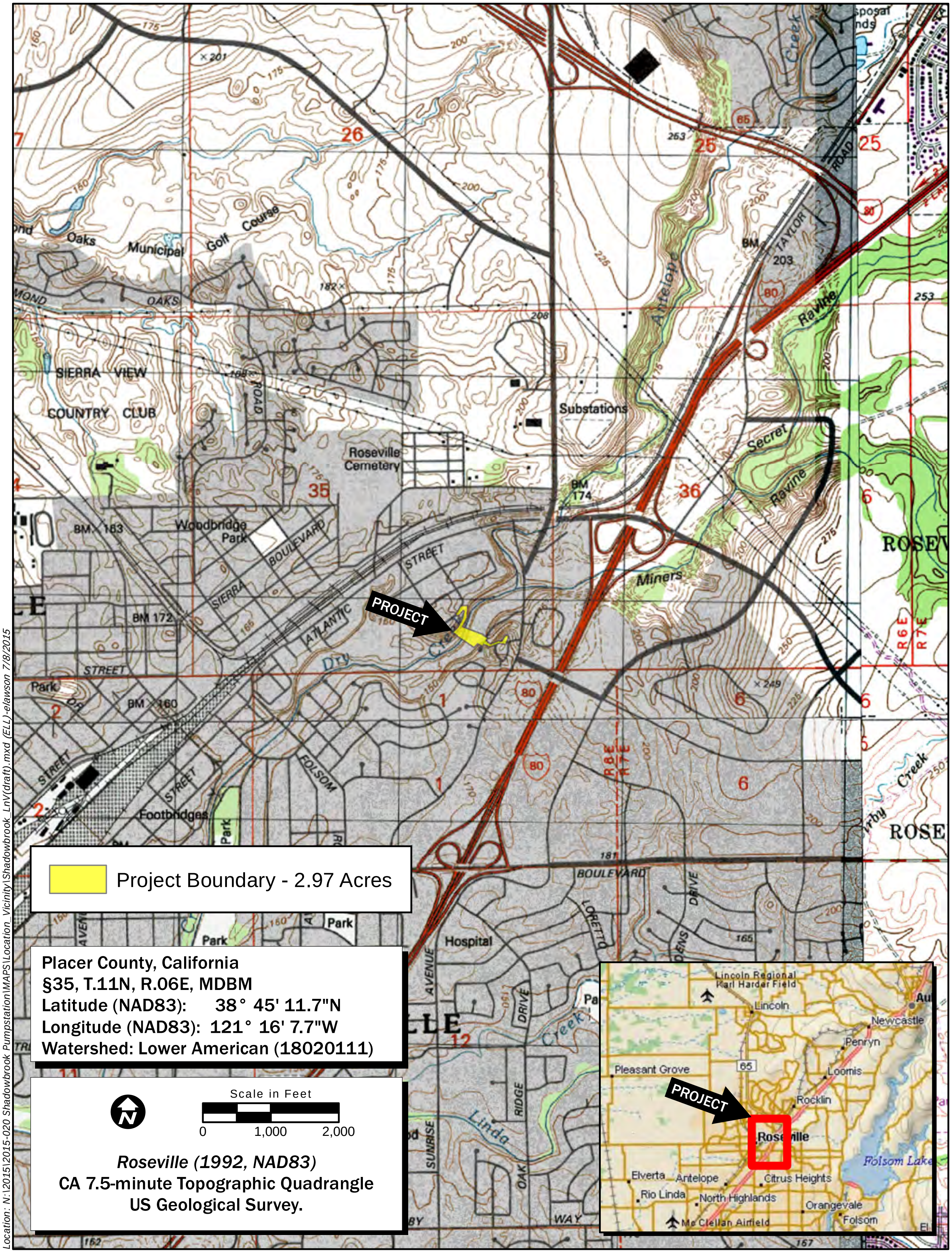
Thank you for providing KDA with this opportunity to provide ECORP Consulting with air quality emissions modeling services on the Shadowbrook Lift Station and Force Main Project. Please let me know if you have any questions about this letter report.

Sincerely,

KD Anderson & Associates, Inc.

Wayne Shijo
Project Manager

enclosures



🟨 Project Boundary - 2.97 Acres

Placer County, California
§35, T.11N, R.06E, MDBM
Latitude (NAD83): 38° 45' 11.7"N
Longitude (NAD83): 121° 16' 7.7"W
Watershed: Lower American (18020111)

Roseville (1992, NAD83)
CA 7.5-minute Topographic Quadrangle
US Geological Survey.

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Location_Vicinity\Shadowbrook_LnV(draft).mxd (ELL)-elawson 7/8/2015

Map Date: 7/8/2015
Service Layer Credits: Copyright:© 2014 DeLorme

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Location

2015-020 Shadowbrook Lift Station and Force Main Project

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\CEQA\SBPS_CEQA_SurroundingLU_20151021.mxd (DEK)-dkrolick 10/21/2015

Map Date: 10/21/2015

[1] Hatch Mott MacDonald; Photo Source: USGS 2013

Scale in Feet
0 150

N

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 2. Surrounding Land Uses

2015-020 Shadowbrook Lift Station and Force Main Project

Table 1. Placer County Air Pollution Control District
Criteria Pollutant Significance Thresholds

Pollutant	Project-Level Thresholds	Cumulative Impact Thresholds
Reactive Organic Gases (ROG)	82	10
Nitrogen Oxides (NO_x)	82	10
Inhalable Particulate Matter (PM_{10})	82	N/A
Carbon Monoxide (CO)	550	N/A

Sources: Placer County Air Pollution Control District *CEQA Air Quality Handbook – Assessing and Mitigating Air Quality Impacts Under CEQA* and staff.

Notes: Per the *CEQA Air Quality Handbook*, project-level thresholds are applied to both construction-related and operational emissions, cumulative-level thresholds are applied to operational emissions.

All thresholds are expressed in pounds per day.

"N/A" = Not applicable.

Table 2. Construction-Related Emissions

Pollutant	Project-Related Emissions	Project-Level Significance Thresholds	Significant Impact?
Reactive Organic Gases (ROG)	3.20	82	No
Nitrogen Oxides (NO_x)	33.90	82	No
Inhalable Particulate Matter (PM_{10})	6.90	82	No
Carbon Monoxide (CO)	19.90	550	No

Sources: KD Anderson & Associates 2015, CalEEMod emissions model.
Thresholds from Placer County Air Pollution Control District *CEQA Air Quality Handbook – Assessing and Mitigating Air Quality Impacts Under CEQA* and staff.

Notes: All values are expressed in pounds per day.
Values shown are maximums of all construction phases.

Road Construction Emissions Model, Version 7.1.5.1

Emission Estimates for -> Shadowbrook Lift Station & Force Main				**Total**	**Exhaust**	**Fugitive Dust**	**Total**	**Exhaust**	**Fugitive Dust**	
Project Phases (English Units)	**ROG (lbs/day)**	**CO (lbs/day)**	**NOx (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	**PM2.5 (lbs/day)**	**PM2.5 (lbs/day)**	**PM2.5 (lbs/day)**	**CO2 (lbs/day)**
Grubbing/Land Clearing	1.6	9.5	18.0	5.9	0.9	5.1	1.8	0.8	1.1	2,029.8
Grading/Excavation	3.2	19.9	33.9	6.9	1.8	5.1	2.7	1.7	1.1	4,144.0
Drainage/Utilities/Sub-Grade	2.9	15.6	29.2	6.6	1.6	5.1	2.5	1.4	1.1	3,203.4
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	3.2	19.9	33.9	6.9	1.8	5.1	2.7	1.7	1.1	4,144.0
Total (tons/construction project)	0.1	0.8	1.4	0.3	0.1	0.2	0.1	0.1	0.0	166.6

Notes: Project Start Year -> 2016
Project Length (months) -> 5
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 1
Total Soil Imported/Exported (yd^3/day)-> 0

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

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

Emission Estimates for -> Shadowbrook Lift Station & Force Main				**Total**	**Exhaust**	**Fugitive Dust**	**Total**	**Exhaust**	**Fugitive Dust**	
Project Phases (Metric Units)	**ROG (kgs/day)**	**CO (kgs/day)**	**NOx (kgs/day)**	**PM10 (kgs/day)**	**PM10 (kgs/day)**	**PM10 (kgs/day)**	**PM2.5 (kgs/day)**	**PM2.5 (kgs/day)**	**PM2.5 (kgs/day)**	**CO2 (kgs/day)**
Grubbing/Land Clearing	0.7	4.3	8.2	2.7	0.4	2.3	0.8	0.4	0.5	922.7
Grading/Excavation	1.5	9.1	15.4	3.1	0.8	2.3	1.2	0.8	0.5	1,883.6
Drainage/Utilities/Sub-Grade	1.3	7.1	13.3	3.0	0.7	2.3	1.1	0.7	0.5	1,456.1
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	1.5	9.1	15.4	3.1	0.8	2.3	1.2	0.8	0.5	1,883.6
Total (megagrams/construction project)	0.1	0.7	1.3	0.3	0.1	0.2	0.1	0.1	0.0	151.1

Notes: Project Start Year -> 2016
Project Length (months) -> 5
Total Project Area (hectares) -> 0
Maximum Area Disturbed/Day (hectares) -> 0
Total Soil Imported/Exported ($meters^3$/day)-> 0

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

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

APPENDIX B

Biological Resources Assessment

Biological Resources Assessment
Shadowbrook Lift Station and Force Main Project

Placer County, California

Prepared For:

Hatch Mott MacDonald

29 February 2016

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

1.0 INTRODUCTION

At the request of Hatch Mott MacDonald, ECORP Consulting, Inc. (ECORP) conducted a Biological Resource Assessment for the proposed Shadowbrook Lift Station and Force Main Project (Project) located in Placer County, California. The purpose of this Biological Resources Assessment is to assess the potential for occurrence of special-status plant and animal species or their habitat, as well as sensitive habitats such as wetlands within the Project site and the vicinity, and provide recommendations to reduce impacts to biological resources.

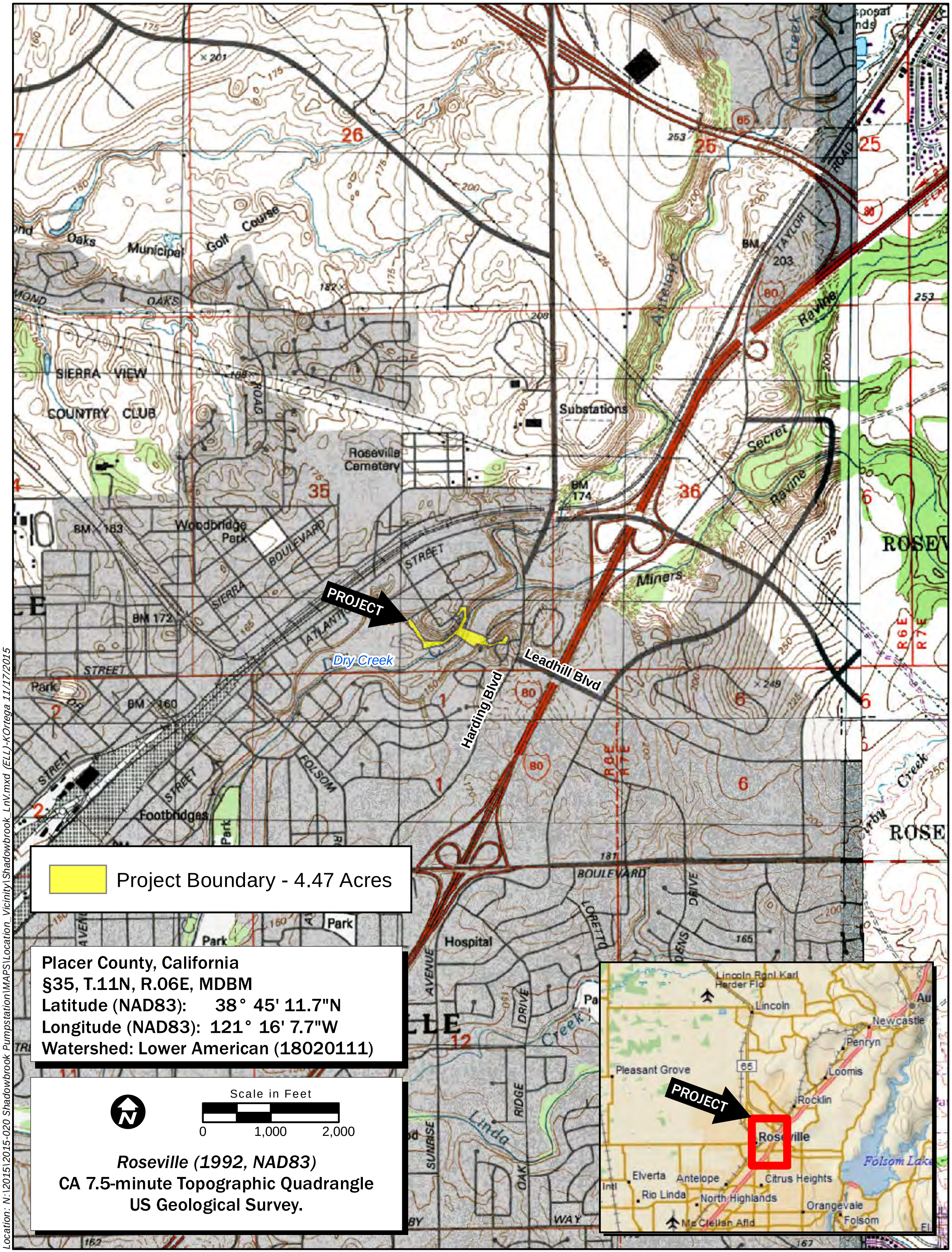
1.1 Project Location

The Project site consists of approximately 2.97 acres located east of Harding Boulevard in the northwest portion of the City of Roseville, Placer County, California. The Project site corresponds to a portion of Section 35 of Township 11 North, Range 06 East, Mount Diablo Base and Meridian (MDBM) of the “Roseville, California” 7.5’ minute topographic quadrangle (U.S. Department of the Interior, Geological Survey [USGS] 1992) (Figure 1. *Project Location and Vicinity*). The approximate center of the site is located at 38° 45’ 11.7” North and 121° 16’ 7.7” West within the Lower American Watershed (Hydrologic Unit Code #18020111, USGS 1978). The central portion of the Project site bisects Dry Creek and Lincoln Estates Park. The Project site is primarily surrounded by residential homes on the west and south and an apartment complex and industrial park on the north and east. The Project site is less than 0.5 mile west of Interstate 80.

1.2 Project Description

The Proposed Project involves rehabilitation of the existing Shadowbrook Lift Station to improve its resiliency to sewer system overflows. The Proposed Project would involve installation of a new fiberglass wet well within the existing pump station steel wet well, thereby occupying the same footprint. The new wet well would extend to a point approximately one foot above the 100 year floodplain. The existing masonry enclosure surrounding the pump station would be partially reconfigured to raise the concrete working pad to match the new top of wet well elevation and the existing lift station masonry block walls would also be extended vertically to retain the present 8 foot distance above grade. The footprint for the concrete pad would also be extended to provide a secured area for a permanently mounted on-site standby generator. The expansion area would be immediately adjacent to the existing lift station facility and overlay an area which is currently occupied by a concrete pad. The reconstructed lift station would cover an area of approximately 4,000 square feet which is larger than the existing facility.

Additionally, the Proposed Project includes installation of new dual six-inch force mains to connect from the lift station to the existing 63-inch Dry Creek Interceptor sewer line located on the west side of the creek. The purpose for the second force main is to provide system redundancy rather than capacity for future sewage flows (sewer shed is built out). The new dual force mains would be approximately 370 feet in length and would consist of ductile iron pipe with ceramic epoxy lining.



🟨 Project Boundary - 4.47 Acres

Placer County, California
§35, T.11N, R.06E, MDBM
Latitude (NAD83): 38° 45' 11.7"N
Longitude (NAD83): 121° 16' 7.7"W
Watershed: Lower American (18020111)

Scale in Feet
0 1,000 2,000

Roseville (1992, NAD83)
CA 7.5-minute Topographic Quadrangle
US Geological Survey.

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Location_Vicinity\Shadowbrook_LnV.mxd (ELL)-KOrtega 11/17/2015

Map Date: 11/17/2015
Service Layer Credits: Copyright:© 2013 DeLorme

Figure 1. Project Location and Vicinity

2015-020 Shadowbrook Pumpstation

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

1.3 Biological Setting

The Project site is located within the Central Valley and has a Mediterranean climate, characterized by hot and dry summer months and cold and wet winter months. The mean monthly temperatures in Roseville range from 35°F in December to 96°F in July, and the average annual precipitation is 23 inches, with the wettest period during November-March (Western Regional Climate Center 2015). The Project site has an elevation ranging between 140 to 180 feet above mean sea level (MSL). The local topography slopes toward Dry Creek in the middle of the site. The Project site is characterized by weedy, ruderal vegetation with some riparian habitat. The outer portions of the site have been paved or modified within and adjacent to the residential areas. Representative site photographs of the Project site and adjacent areas are included in Attachment A.

1.4 Purpose of this Biological Resources Assessment

The purpose of this Biological Resources Assessment is to assess the potential for occurrence of special-status plant and animal species or their habitat, as well as sensitive habitats such as wetlands within the Project site and the vicinity. This assessment does not include determinate field surveys conducted according to agency-promulgated protocols. The conclusions and recommendations presented in this report are based upon a literature review, database queries, and limited site reconnaissance.

For the purposes of this assessment, special-status species are defined as plants or animals that:

- are listed, proposed for listing, or candidates for future listing as threatened or endangered under the Federal Endangered Species Act (FESA);
- are listed or candidates for future listing as threatened or endangered under the California Endangered Species Act (CESA);
- meet the definitions of endangered or rare under Section 15380 of the California Environmental Quality Act (CEQA) Guidelines;
- are identified as a species of special concern by the California Department of Fish and Wildlife (CDFW);
- are birds identified as birds of conservation concern by the United States Fish and Wildlife Service (USFWS);
- are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1 and 2);
- are plants considered by CNPS as species about which more information is needed to determine their status (CRPR 3), and plants of limited distribution (CRPR 4). CRPR 3 and 4 species are only included in this assessment if they have been identified by local jurisdictions as having local significance or regional importance;
- are plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.); or

- are fully protected in California in accordance with the California Fish and Game Code, Sections 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes).

2.0 REGULATORY SETTING

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

FESA protects plants and animals that are listed as endangered or threatened by the USFWS and the National Marine Fisheries Service (NMFS). Section 9 of FESA prohibits the taking of listed wildlife, where take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 USC 1538). Under Section 7 of FESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion (BO), the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of FESA provides for issuance of incidental take permits where no other federal actions are necessary provided a habitat conservation plan is developed.

Section 7

Section 7 of FESA mandates that all federal agencies consult with USFWS and/or NMFS to ensure that federal agencies' actions do not jeopardize the continued existence of a listed species or adversely modify critical habitat for listed species. If direct and/or indirect effects will occur to critical habitat that appreciably diminish the value of critical habitat for both the survival and recovery of a species, the adverse modifications will require formal consultation with USFWS or NMFS. If adverse effects are likely, the applicant must conduct a biological assessment (BA) for the purpose of analyzing the potential effects of the project on listed species and critical habitat to establish and justify an "effect determination." The federal agency reviews the BA; if it concludes that the project may adversely affect a listed species or its habitat, it prepares a BO. The BO may recommend "reasonable and prudent alternatives" to the project to avoid jeopardizing or adversely modifying habitat.

Critical Habitat and Essential Habitat

Critical Habitat is defined in Section 3 of FESA as (1) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with FESA, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. For inclusion in a critical habitat designation, habitat within the geographical area occupied by the species at the time it was listed must first have features that are essential to the conservation of the species. Critical Habitat designations identify, to the extent known and using the best scientific data available, habitat areas that provide essential life cycle needs of the species (areas on which are found the primary constituent elements). Primary constituent elements are the physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These include but are not limited to the following:

- Space for individual and population growth and for normal behavior
- Food, water, air, light, minerals, or other nutritional or physiological requirements
- Cover or shelter
- Sites for breeding, reproduction, or rearing (or development) of offspring
- Habitats that are protected from disturbance or are representative of the historic, geographical, and ecological distributions of a species

Excluded essential habitat is defined as areas that were found to be essential habitat for the survival of a species and assumed to contain at least one of the primary constituent elements for the species but were excluded from the critical habitat designation. The USFWS has stated that any action within the excluded essential habitat that triggers a federal nexus will be required to undergo the Section 7(a)(1) process, and the species covered under the specific critical habitat designation would be afforded protection under Section 7(a)(2) of FESA.

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR part 13 General Permit Procedures and 50 CFR Part 21 Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code.

2.1.3 Federal Clean Water Act

The Federal Clean Water Act's (CWA) purpose is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "Waters of the United States" without a permit from the U.S. Army Corps of Engineers (USACE). The definition of Waters of the U.S. includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The U.S. Environmental Protection Agency also has authority over wetlands and may override a USACE permit.

Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

2.2 State or Local Regulations

2.2.1 California Fish and Game Code

California Endangered Species Act

CESA (Fish and Game Code Sections 2050-2116) generally parallels the main provisions of FESA, but unlike its federal counterpart, CESA applies the take prohibitions to species proposed for listing (called "candidates" by the state). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered, threatened or candidate species or result in destruction or adverse modification of essential habitat.

Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of CESA and FESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA. The regulations that implement the Fully Protected Species Statute (California Fish and Game Code §4700 for mammals, §3511 for birds, §5050 for reptiles and amphibians, and §5515 for fish) provide that fully protected species may not be taken or possessed at any time. Furthermore, CDFW prohibits any state agency from issuing incidental take permits for fully protected species. CDFW will issue licenses or permits for take of these species for necessary scientific research or live capture and relocation pursuant to the permit.

Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW and provided in the California Fish and Game Code Sections 1900-1913. The Fish and Wildlife Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. CESA (California Fish and Game Code §2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

Birds of Prey

Sections 3800, 3513, and 3503 of the California Fish and Game Code specifically protect birds of prey. Section 3800 states that it is unlawful to take non-game birds, such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in accordance with regulations of the commission or a mitigation plan approved by CDFW for mining operations. Section 3513 specifically prohibits the take or possession of any migratory non-game bird as designated in the MBTA.

Section 3503 of the California Fish and Game Code prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Additionally, Subsection 3503.5 prohibits the take, possession, or destruction of any birds and their nests in the orders Strigiformes (owls) or Falconiformes (hawks and eagles). These provisions, along with the federal MBTA, serve to protect nesting native birds.

California Streambed Alteration Notification/Agreement

Section 1602 of the California Fish and Game Code requires that a Streambed Alteration Application (SAA) be submitted to CDFW for “any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake.” CDFW reviews the proposed actions and, if necessary, submits proposed for measures to protect affected fish and wildlife resources to the applicant. The SAA is the final proposal that is mutually agreed-upon by CDFW and the Applicant. Often, projects that require an SAA also require a permit from the USACE under Section 404 of the CWA. In these instances, the conditions of the Section 404 permit and the SAA overlap.

2.2.2 Species of Special Concern

Species of Special Concern (SSC) are defined by the CDFW as a species, subspecies, or distinct population of an animal native to California that are not legally protected under FESA, CESA or the California Fish and Game Code, but currently satisfies one or more of the following criteria:

- The species has been completely extirpated from the state or, as in the case of birds, it has been extirpated from its primary seasonal or breeding role
- The species is listed as federally (but not state) threatened or endangered, or meets the state definition of threatened or endangered but has not formally been listed
- The species has or is experiencing serious (non-cyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status
- The species has naturally small populations that exhibit high susceptibility to risk from any factor that if realized, could lead to declines that would qualify it for state threatened or endangered status
- SSC are typically associated with habitats that are threatened. Project-related impacts to SSC, state-threatened or endangered species are considered “significant” under CEQA

2.2.3 California Plant Ranks

The California Native Plant Society (CNPS) maintains the *Inventory of Rare and Endangered Plants of California* (CNPS 2015), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, and/or low populations. Plant species meeting one of these criteria are assigned to one of six California Rare Plant Ranks. The rank system was developed in collaboration with government, academia, non-governmental organizations, and private sector botanists, and is jointly managed by CDFW and the CNPS. The California Rare Plant Ranks are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS California Rare Plant Ranks:

- Rare Plant Rank 1A – presumed extirpated in California and either rare or extinct elsewhere
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere
- Rare Plant Rank 2A – presumed extirpated in California, but more common elsewhere
- Rare Plant Rank 2B – rare, threatened, or endangered in California but more common elsewhere
- Rare Plant Rank 3 – a review list of plants about which more information is needed
- Rare Plant Rank 4 – a watch list of plants of limited distribution

Additionally, the CNPS has defined Threat Ranks that are added to the California Rare Plant Rank as an extension. Threat Ranks designate the level of threat on a scale of 1 through 3, with 1 being the most threatened and 3 being the least threatened. Threat Ranks are generally present for all plants ranked 1B, 2B, or 4, and for the majority of plants ranked 3. Plant species ranked 1A and 2A (presumed extirpated in California), and some species ranked 3, which lack threat information, do not typically have a Threat Rank extension. The following are definitions of the CNPS Threat Ranks:

- Threat Rank 0.1 – Seriously threatened in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
- Threat Rank 0.2 – Moderately threatened in California (20-80 percent occurrences threatened/moderate degree and immediacy of threat)
- Threat Rank 0.3 – Not very threatened in California (<20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known)

Factors such as habitat vulnerability and specificity, distribution, and condition of occurrences are considered in setting the Threat Rank, and differences in Threat Ranks do not constitute additional or different protection (CNPS 2015). Depending on the policy of the lead agency, substantial impacts to plants ranked 1A, 1B, or 2 are typically considered significant under CEQA Guidelines §15380. Significance under CEQA is typically evaluated on a case-by-case basis for plants ranked 3 or 4.

2.2.4 Porter-Cologne Water Quality Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of storm water runoff associated with construction activities.

General Construction Permits for projects that disturb one or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, with any region that could affect the water of the state" (Water Code 13260(a)). Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code 13050 (e)). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by the USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of a Waste Discharge Requirements for these activities.

2.2.5 California Environmental Quality Act

Per CEQA Guidelines' §15380 a species not protected on a federal or state list may be considered rare or endangered if the species meets certain specified criteria. These criteria follow the definitions in FESA, CESA and Sections 1900-1913 of the California Fish and Game Code, which deal with rare or endangered plants or animals. Section 15380 was included in the Guidelines primarily to deal with situations where a project under review may have a significant effect on a species that has not yet been listed by either the USFWS or CDFW.

CEQA Significance Criteria

Sections 15063-15065 of CEQA Guidelines address how an impact is identified as significant and are particularly relevant to SSCs. Generally, impacts to listed (rare, threatened, or endangered) species are considered significant and require lead agencies to prepare an Environmental Impact Report to thoroughly analyze and evaluate the impacts. Assessment of "impact significance" to populations of non-listed species (i.e., SSCs) usually considers the proportion of the species' range that will be affected by a project, impacts to habitat, and the regional and population level effects.

Specifically, §15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if the project would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- have a substantial adverse effect on federally protected Waters of the U.S. including wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;

- 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;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

An evaluation of whether or not an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of an important resource on a population-wide or region-wide basis.

2.2.6 City of Roseville General Plan

The City of Roseville General Plan contains several goals and polices pertaining to the conservation and protection of biological resources. The following goals and polices are from the Open Space and Conservation Element section of the City of Roseville General Plan and may be applicable to the Project (City of Roseville 2015a).

Vegetation and Wildlife

C. Goals and Policies

Goal 1 *Preserve, protect, and enhance a significant system of interconnected natural habitat areas, including creek and riparian corridors, oak woodlands, wetlands, and adjacent grassland areas.*

Goal 2 *Maintain healthy and well-managed habitat areas in conjunction with one another, maximizing the potential for compatible open space, recreation, and visual experiences.*

Goal 3 *Protect special-status species and other species that are sensitive to human activities.*

Policies: Vegetation and Wildlife

1. Incorporate existing trees into development projects, and where preservation is not feasible, continue to require mitigation for the loss of removed trees. Particular emphasis shall be placed on avoiding the removal of groupings or groves of trees.

2. Preserve and rehabilitate continuous riparian corridors and adjacent habitat along the City's creeks and waterways.

3. Require dedication of the City's Regulatory Floodplain, as defined in the Safety Element, or comparable mechanism to protect habitat and wildlife values in perpetuity.
4. Require preservation of contiguous areas in excess of the City's Regulatory Floodplain, as defined in the Safety Element, as merited by special resources or circumstances. Special circumstances may include, but are not limited to, sensitive wildlife or vegetation, wetland habitat, oak woodland areas, grassland connections in association with other habitat areas, slope or topographical considerations, recreation opportunities, and maintenance access requirements.
5. Limit recreation activities within the City's Regulatory Floodplain, as defined in the Safety Element, and require appropriate setback areas for trails and other public recreation uses so that natural resource areas are not adversely impacted.
6. Provide for protection and enhancement of native fishery resources, including continued coordination with the California Department of Fish and Game to release water into Linda Creek.
7. Require cumulative mitigation plans for wetlands, where feasible, in association with specific plans.
8. Consider substitute site mitigation for federally nonregulated wetlands, provided that such mitigation will provide comparable habitat values.
9. Limit the access of pedestrians and cyclists to vernal pool and wetland areas so that access is compatible with long-term protection of these natural resource areas.
10. Manage public lands with special-status species to encourage propagation of the species and discourage non-indigenous, invasive species.
11. Habitat preservation and mitigation for woodlands, creeks, riparian and seasonal wetland areas should occur within the defined boundaries of the impacting projects where long-term resource viability is feasible and desirable.
12. Consider the use of City property for habitat preservation and mitigation requirements resulting from development proposals when such efforts do not conflict with existing resources, recreational opportunities, or other City goals, policies, or programs.
13. Work with adjacent jurisdictions, regulatory agencies, and community organizations to explore opportunities for regional mitigation banking.

2.2.7 City of Roseville Tree Preservation Ordinance

Chapter *19.66 Tree Preservation* of the Roseville Municipal Code includes provisions for the protection of trees within the City of Roseville. The purpose of the Tree Preservation Ordinance is to protect Roseville's native vegetation that consists of valley grasslands with scattered native oaks and oak and riparian woodlands. According to the Municipal Code, a protected tree is any "native oak tree equal to or greater than six inches diameter at breast height (DBH) measured as a total of a single trunk or multiple trunks" (City of Roseville 2015b). If protected trees are present, a tree permit may be required.

19.66.030 Tree Permits:

A. Permit Required. No person shall conduct any regulated activities within the protected zone of any protected tree; or harm, destroy, kill or remove any protected tree unless authorized by a Tree Permit or as provided in subsection C.

B. Type of Permit.

1. Administrative Tree Permit. An Administrative Tree Permit is required for any regulated activity affecting one or more protected trees, when the regulated activity is not associated with a discretionary project, does not include the removal of a protected tree, and the requested encroachment does not exceed 20 percent of the protected zone of any individual protected tree.

2. Tree Permit. A Tree Permit is required for any regulated activity within the protected zone of a protected tree where the encroachment exceeds 20 percent of the protected zone, or where the regulated activity is related to a discretionary project. In addition, a Tree Permit is required for the removal of any protected tree, unless otherwise exempted by this chapter.

C. Exemptions. A Tree Permit is not required for the removal of a protected tree under the following circumstances:

1. Trees damaged by thunderstorm, windstorm, flood, earthquake, fire or other natural cause and determined by a peace officer, fire fighter, public utility official, civil defense official or City code enforcement officer, acting in his or her official capacity, to present a danger to persons or property. Upon discovery of a condition justifying removal, the officer or official making the determination shall immediately provide written notification of the condition and action taken to the Planning Manager.

2. When removal is determined to be necessary by fire department personnel actively engaged in fighting a fire.

3. When compliance would interfere with activities of a public utility necessary to comply with applicable safety regulations and/or necessary to repair or avoid the interruptions of services provided by such a utility. Unless there is an imminent threat to the public health, safety or welfare, the Planning Manager shall be notified prior to the removal by a public utility of a protected tree.

4. The Planning Manager may allow removal of a protected tree which has been certified by an arborist to be a dead tree. An arborist-certified dead tree may be removed without any replacement or mitigation requirements.

5. A protected tree located on property developed with a single-family or two-family dwelling which has been granted occupancy.

6. When a protected living tree presents a hazard to health and safety or structures due to its structural condition and location, the tree may be removed without any replacement or mitigation requirements. The hazardous condition of the tree must be determined by an arborist. The Planning Manager must review the arborist's determination and consider the location of the protected tree prior to approving removal. (Ord. 5428 § 1, 2014.)

2.3 City Of Roseville Mitigating Ordinances, Guidelines, and Standards

The CEQA Guidelines allow the use of previously adopted development policies or standards as mitigation for the environmental effects of future projects, when the standards have been adopted by the City with findings, based on substantial evidence, that the policies or standards will substantially mitigate environmental effects, unless substantial new information shows that the policies or standards will not substantially mitigate the effects (§15183[f]). In April 2008, the City of Roseville adopted Findings of Fact related to the mitigating policies and standards, and adopted the City of Roseville CEQA implementing procedures for the preparation, processing, and review of environmental documents (Resolution 08-172). These Findings are applicable to the following regulations and ordinances, which include standards and policies that are uniformly applied throughout the City, and will substantially mitigate specified environmental effects of future projects:

- Noise Regulation (RMC Ch.9.24)
- Urban Stormwater Quality Management and Discharge Control Ordinance (RMC Ch.14.20)
- Stormwater Quality Design Manual (Resolution 07-432)
- City of Roseville Design and Construction Standards (Resolution 07-137)
- Community Design Guidelines (Resolution 95-347)
- Tree Preservation Ordinance (RMC Ch.19.66)

The City's Mitigating Ordinances, Guidelines, and Standards are referenced, where applicable, in the Environmental Checklist, and will be implemented by the City as part of the Proposed Project to reduce potential impacts to a Less Than Significant Level.

2.3.1 Environmental Commitments

In addition to the City's Mitigating Ordinances, Guidelines, and Standards discussed above, the Project would implement a variety of BMPs and other measures to avoid short- and long-term effects on the physical and human environment. These activities would be included in the contract specifications for contractors working on the Proposed Project, and implemented during Project construction. The following BMPs would be implemented to maintain water quality and aquatic habitat objectives defined by current regulatory standards are described below.

BMP — 1: Conduct Environmental Awareness Training for Construction Personnel

Before any work occurs in the project area, including grading, a Qualified Biologist will conduct mandatory contractor/worker awareness training for construction personnel. The awareness training will be provided to all construction personnel to brief them on the need to avoid impacts on biological resources and the penalties for non-compliance. If new construction personnel are added to the project, the City will ensure that the personnel receive the mandatory training from the biologist before starting work.

BMP — 2: Install Construction Barrier Fencing to Protect Environmentally Sensitive Areas

The City will install orange construction barrier fencing to identify environmentally sensitive areas (ESAs). ESAs in and adjacent to the construction area comprise mixed riparian forest, native oak trees greater than six inches diameter breast height (DBH), wetland drainages, and any trees that support migratory bird or raptor nests. Before construction, the City will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the ESAs to indicate these locations. The protected area will be clearly identified on the construction plans. The fencing will be installed before construction activities are initiated and will be maintained throughout the construction period. The following note will be included in the construction plans:

> *"The contractor's attention is directed to the areas designated as "environmentally sensitive areas" as shown on the plans. These areas are protected, and no entry by the contractor for any purpose will be allowed unless specifically authorized in writing by the City's project manager. The City and contractor's project managers will take measures to ensure that construction crew do not enter or disturb these areas, including giving written notice to crew members."*

Temporary fences around the ESAs will be installed as the first order of work. Temporary fences will be furnished, constructed, maintained, and removed as shown on the plans, as directed by the project engineer. The fencing will be commercial-quality woven polypropylene, orange in color, and at least four feet high (Tensor Polygrid or equivalent).

BMP — 3: Retain a Biologist to Monitor Construction Activities in the Creek Corridor

The City will retain a biologist to make a weekly monitoring visit to the project site. The biological monitor will advise the construction crew, as needed how to comply with all project implementation restrictions and guidelines. Furthermore, the biological monitor will be responsible for notifying the contractor if the ESA barrier fencing needs maintenance.

BMP— 4: Avoid and Minimize Disturbance of Dry Creek and Associated Aquatic Habitat

To the extent possible, the City and contractor will minimize impacts on Dry Creek and associated aquatic habitat by implementing the following:

- Prior to working within the Dry Creek corridor, all heavy equipment will be checked by the City inspector and maintained daily to prevent leaks of materials that if introduced to water could be deleterious to aquatic life;
- Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances associated with project-related activities that could be hazardous to aquatic life will be prevented from contaminating the soil or entering Dry Creek channel;
- During construction, the City will not dump any material in the stream channel except as shown on the project plans. All such debris and waste will be picked up daily and properly disposed of at an appropriate site. All construction debris and associated materials will be removed from the work site upon completion of the project;
- Sediment fences will be installed in appropriate locations to reduce the introduction of sediment into creeks during construction. Any overburden material from the Proposed Project will not be sidecast into the creek channel, but will be stabilized or stored off site at approved disposal sites to preclude increased risk of sediment input to creeks;
- The City and contractor will establish spill prevention and countermeasure plan before project construction begins; the plan will include on-site handling criteria to avoid input of contaminants to the waterway. A staging and storage area will be provided away from the waterway for equipment, construction materials, fuels, lubricants, solvents, and other possible contaminants. This plan will be approved by the City project manager prior to the start of construction;
- After construction, the work area within the creek corridor will be stabilized and landscaped according to the erosion and sediment control standards set forth in the *City's Stormwater Quality BMP Guidance Manual for Construction* (March 2007);
- All maintenance materials (e.g., oils, grease, lubricants, antifreeze, and similar materials) will be stored off-site; and
- During construction, all vehicles and equipment required on site will be parked or stored at the staging areas.
- Precautions to minimize turbidity/siltation will be taken into account during project planning and implementation. Such precautions may entail the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches. Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures will be taken. The sediment barrier(s) will be maintained in good operating condition throughout the construction period. Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged silt fencing, coir logs, coir rolls, and/or straw bale dikes. Non-biodegradable silt barriers (such as plastic silt fencing) shall be removed after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season).

BMP — 5: Minimize Potential for the Long-Term Loss of Mixed Riparian Forest

To the extent possible, the City will minimize the potential for the long-term loss of riparian vegetation by trimming vegetation rather than removing entire shrubs. Shrubs that need to be trimmed will be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting will be limited to the minimum area necessary within the construction zone. Disturbance or removal of vegetation will not exceed the minimum necessary to complete operations. Except for the vegetation specifically identified for trimming and/or removal in the notification, no native oak trees with a trunk diameter greater than six inches DBH will be removed or damaged without prior consultation and approval of a City Planning Department representative. Using hand tools (e.g., clippers, chain saw), trees may be trimmed to the extent necessary to gain access to the work sites. All cleared material/vegetation will be removed out of the riparian/stream zone.

BMP — 6: Conduct a Pre-Construction Survey for Western Pond Turtles and Implement Measures to Avoid Impacts

To avoid construction-related impacts on western pond turtles, the City will retain a wildlife biologist to conduct a pre-construction survey for western pond turtles no more than 48 hours before the start of construction. The wildlife biologist will look for adult pond turtles, in addition to nests containing pond turtle hatchlings and eggs. If a western pond turtle is located in the construction area, the biologist will move the turtle to a suitable aquatic site outside the construction area. If an active pond turtle nest containing either pond turtle hatchlings or eggs is found, the City will consult the CDFW to determine and implement appropriate avoidance measures, which may include a "no-disturbance" buffer around the nest site until the hatchlings have moved to a nearby aquatic site.

BMP —7: Construct Outside of Nesting Season or Conduct Pre-Construction Raptor Nesting Surveys

To avoid disturbance of raptor breeding and nesting activity, including nesting of sensitive raptors, project activities will be avoided during the typical raptor breeding season of March through August, to the extent feasible. If construction must take place during the typical nesting season, pre-construction surveys will be conducted by a Qualified Biologist no more than 30 days prior to initiation of proposed construction activities.

Surveys will be conducted to determine if active nesting is occurring on or directly adjacent to the study area. If active nests are found on or immediately adjacent to the site, survey results will be submitted to CDFW and consultation will be initiated with CDFW to determine appropriate avoidance measures. If no nesting is found to occur, necessary tree removal and other project activities could then proceed.

BMP — 8: Comply with Agency Permitting Requirements and Provide for No Net Loss of Wetlands

The City shall comply with all applicable Corps, U.S. Fish and Wildlife Service (USFWS), CDFW, RWQCB, and National Marine Fisheries Service (NMFS) permitting and mitigation requirements. The City shall meet the agencies' no net loss of wetlands policy through one of the following measures:

- Avoid impacts through project design; and
- Compensate for impacts by acquiring (through fee title or credits in an approved mitigation bank) replacement habitat.

The City is responsible for obtaining all required permits and authorizations from local, State, and federal agencies. If a conflict arises between the provisions of any of the permits, the City shall comply with the provision that offers the greatest protection to water quality, Species of Special Concern, and/or Critical Habitat. Copies of the permits will be provided to the construction crew with the construction plans.

BMP — 9: Avoid the Introduction or Spread of Noxious Weeds in the Project Area

To avoid the introduction or spread of noxious weeds into previously uninfested areas (especially within the riparian community along Dry Creek), the City will revegetate disturbed areas immediately after construction is complete using certified weed-free native and nonnative mixes.

BMP — 10: Comply with Requirements of the Tree Preservation Chapter of the Roseville Zoning Ordinance

The City will comply with the City's Tree Preservation Ordinance as applicable, including avoidance, minimization, or compensation for the removal or disturbance of native oak trees greater than 6 inches DBH during construction. If native oak trees will be affected by the project, the City will be required to prepare a tree mitigation plan that identifies trees that qualify for protection and specifies mitigation for impacts. For any oak trees that would be removed, the City will mitigate the impact through either on-site planting or use of the City's in-lieu fee program.

3.0 METHODS

3.1 Literature Review

Prior to conducting the field portion of the assessment, the following species lists were queried to determine the special-status species that had been documented within or in the vicinity of the site:

- CDFW CNDDB for the "Citrus Heights, Folsom, Pleasant Grove, Rio Linda, Rocklin, Roseville, California" 7.5-minute USGS quadrangles (CDFW 2015)
- USFWS Resource Report List for the project site (USFWS 2015)
- CNPS electronic *Inventory of Rare and Endangered Plants of California* was queried for the "Roseville, California" 7.5-minute USGS quadrangle, and the eight surrounding USGS topographic quadrangles (CNPS 2015).

3.2 Site Reconnaissance

ECORP biologist/ISA Certified Arborist Krissy Walker (No. WE-11308A) Krissy Walker conducted the site assessment on 15 July 2015. The 2.97-acre Project site was systematically surveyed on foot using a hand-held GPS unit, topographic maps, and aerial imagery to ensure total site coverage. Special attention was given to identifying those portions of the site with the potential to support special-status species and sensitive habitats. During the field survey, biological communities occurring on-site were characterized and the following biological resource information was collected:

- Potential Waters of the U.S.
- Plant and animal species directly observed
- Animal evidence (e.g., scat, tracks)
- Active bird nests
- Burrows and any other special habitat features
- Representative site photographs

In addition, soil types were identified using the United States Department of Agriculture Natural Resource Conservation Service Web Soil Survey (NRCS 2015a).

Additional field data were collected for this site by ECORP senior biologist Keith Kwan as part of a delineation of Waters of the U.S. conducted on 30 July 2015 and a field assessment of an alternative access point 22 October 2015.

3.3 Arborist Survey

An arborist survey was conducted on 29 June 2015 for the Project site by ECORP ISA Certified Arborist Bryan Hill (No. WE-5382A) and biologist Emily Mecke. During the field survey, the Project site was walked and a sub-meter accuracy Trimble GeoXT GPS unit was used to collect location and survey data. Collected data included species, diameter at breast height (DBH), dripline radius, structure, and condition. Inventoried trees included all trees (native and nonnative) with a DBH of six inches or greater. Inventoried trees were tagged with a numbered aluminum tag unless a readable tag (from previous, unrelated survey efforts) was already present on the tree. The following includes detailed definitions of tree data collected:

Diameter at Breast Height: Trunk diameter at 4.5 feet above ground (DBH). Occasional deviations from this height were required for trees with branching at this level, or with unusual structural configurations (e.g., horizontal trunks). On multi-trunked trees (trees with multiple vertical trunks in contact at or near ground level) the report lists total aggregate diameter.

Dripline Radius: The maximum distance from trunk to the edge of the canopy.

Structure: An estimate of the tree's structural soundness, based on obvious external evidence. This evaluates the potential for structural failure of one or more major branches or trunks, the environment and condition of the root crown, symmetry of the canopy, and any noticeable effects of crowding caused by adjacent trees. Rated on a three-point scale (poor, fair, good), with a rating like "fair-good" representing conditions in-between the upper and lower parameters.

Condition: An estimate of the tree's overall health. This includes evaluation of foliage, evidence of wound healing, evidence of fungal attack, density of insect galls, and the amount and condition of attached deadwood. Rated on a three-point scale (poor, fair, good), with a rating like "fair-good" representing conditions in-between the upper and lower parameters.

Native Species: Plants native to the area are defined as those plants believed by the scientific community to have been present in Placer County prior to the settlement by Europeans. The Jepson Manual is the primary reference for determining if a plant is native or nonnative (Baldwin et al. 2012). Additionally, the local chapter of the CNPS may be consulted to determine if a plant should be considered native to the area. Information on wild California plants may also be found on the CalFlora website: www.calflora.org.

Nonnative Species: Any plant not considered a native species as defined above.

Invasive Species: Invasive plant species are plants that are nonnative and are functionally invasive, replacing native vegetation or native habitats. Information on invasive plant species may be found in the California Invasive Plant Council (CalIPC) Inventory (CalIPC 2015). The inventory can be found on the CalIPC website: www.Cal-ipc.org/paf/.

A subsequent survey was conducted on 11 February 2016 by ECORP biologist/ISA Certified Arborist Krissy Walker to collect information regarding three trees that were not identified during the first field survey. Two trees were inventoried with a DBH of 6 inches or greater including one Valley oak and one Fremont's cottonwood.

3.4 Special-Status Species Considered for the Project

Based on species occurrence information from the CNDDB, the literature review, and observations in the field, a list of special-status plant and animal species that have the potential to occur within the Project site was generated (Table 1). Only special-status species as defined in Section 1.4 were included in this analysis. Each of these species' potential to occur on-site was assessed based on the following criteria:

- **Present** - Species was observed during the site visit or is known to occur within the project boundary based on documented occurrences within the CNDDB or other literature
- **Potential to Occur** - Habitat (including soils and elevation requirements) for the species occurs within the project boundary
- **Low Potential to Occur** - Marginal or limited amounts of habitat occurs and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation
- **Absent** - No suitable habitat (including soils and elevation requirements) and/or the species is not known to occur in the vicinity based on CNDDB records and other documentation

4.0 RESULTS

4.1 Site Characteristics and Land Use

From west to east, the project consists of a road in a residential neighborhood, a pedestrian trail, Dry Creek, and a road in an apartment complex. Weedy, ruderal vegetation dominates the Project site, with an overstory of mostly oak and willow trees and a narrow band of riparian vegetation along Dry Creek. Representative site photographs are provided in Attachment A.

4.2 Plant Communities

The three plant communities observed in the Project area include oak woodland with a ruderal annual grassland understory, riparian woodland, and disturbed/developed. The oak woodland is dominated by a mix of interior live oak (*Quercus wislizenii*), Oregon ash (*Fraxinus latifolia*), and willow (*Salix exigua*), and the ruderal grass understory includes prostrate amaranth (*Amaranthus blitoides*), ripgut brome (*Bromus diandrus*), mustard (*Brassica nigra*), and Bermuda grass *(Cynodon dactylon*). The riparian woodland is prominent along the creek and includes water primrose (*Ludwigia peploides* ssp. *peploides*), Fremont's cottonwood (*Populus fremontii*), Himalayan blackberry (*Rubus armeniacus*), and South American vervain (*Verbena bonariensis*). The disturbed/developed habitat consists mostly of impenetrable surfaces (i.e. paved), but includes species such a turkey mullein (*Croton setigerus*), ripgut brome, and Bermuda grass along the vegetated margins of these areas.

4.2.1 Arborist Survey Results

A total of 136 trees with DBH of six inches or greater were inventoried during the survey within or along the Project boundary. A list of all inventoried trees and their associated data are included in Attachment B. These included 7 blue oaks (*Quercus douglasii*), 34 interior live oaks, 8 valley oaks (*Quercus lobata*), 8 scarlet oaks (*Quercus coccinea*), 1 red oak (*Quercus rubra*), 5 Chinese hackberries (*Celtis sinensis*), 2 Aleppo pines (*Pinus halepensis*), 1 tulip tree (*Liriodendron tulipifera*), 3 crape myrtles (*Lagerstroemia indicia*), 1 western redbud (*Cercis occidentalis*), 1 white mulberry (*Morus alba*), 21 Oregon ashes, 3 pecans (*Cara illinoinesis*), 2 Chinese privets (*Ligustrum sinense*), 7 Fremont's cottonwoods, 23 willows (*Salix* sp.), 8 red alders (*Alnus rubra*), and 1 black walnut (*Juglans californica*). Tree locations were recorded with a GPS unit and mapped on an aerial photograph provided as a tree location map in Attachment C.

4.3 Wildlife

This project supports wildlife in all habitats, with the exception of the disturbed/developed areas which only support minimal wildlife movement. Species documented during the field visit included: Western fence lizard (*Sceloporus occidentalis*), house finch (*Haemorhous mexicanus*), turkey vulture (*Cathartes aura*) (dead), acorn woodpecker (*Melanerpes formicivorus*), western scrub-jay (*Aphelocoma californica*), mallard (*Anas platyrhynchos*), and Western gray and Eastern gray squirrels (*Sciurus griseus and S. carolinensis*).

4.4 Soils and Topography

Three soil types occur within the Project site. These include: (142) Cometa-Ramona sandy loams, 1 to 5 percent slopes, (175) Ramona sandy loam, 2 to 9 percent slopes, and (194) Xerofluvents, frequently flooded (Figure 2. *Natural Resources Conservation Service Soil Types*) (NRCS 2015b). Topography is sloped toward Dry Creek, which bisects the Project site.

4.5 Potential Waters of the U.S.

Dry Creek and an ephemeral drainage, an unnamed tributary to Dry Creek, run through the middle of the Project site (Figure 3. *Waters of the U.S.*). Water was present in Dry Creek at the time of the survey, but the ephemeral drainage was dry. Dry Creek ultimately runs to the Sacramento River and therefore has a direct surface connection to existing Waters of the U.S. As such, this feature appears to be jurisdictional; however, the jurisdictional determination is ultimately the responsibility of the USACE.

4.6 Evaluation of Potentially Occurring Special-Status Species

According to the CNDDB, there are no known previously documented occurrences of special-status species within the Project site (CDFW 2015) (Figure 4. *California Natural Diversity Database Occurrences of Special-Status Species*). However, several special-status species occurrences have been documented within an approximate five-mile radius of the site.

Figure 2.
Natural Resources Conservation Service Soil Types

Map Features

▭ Project Boundary

Series Number - Series Name

▨ 142 - Cometa-Ramona sandy loams, 1 to 5 percent slopes

▨ 175 - Ramona sandy loam, 2 to 9 percent slopes

▨ 194 - Xerofluvents, frequently flooded

Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database for Placer County, CA

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Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Soils_and_Geology\Soils\Shadowbrook_Soils_20151109.mxd (EL)-KOrtega 11/9/2015

2015-020 Shadowbrook Lift Station and Force Main Project

Scale in Feet
0 200

N

Photo Source: USGS 2013

Map Date: 11/9/2015

Figure 3.
Waters of the U.S. [2]

Map Features

▭ Project Boundary [1]

△ Three-criteria Sample Point

Waters of the U.S. Acreage [3]

Other Waters:

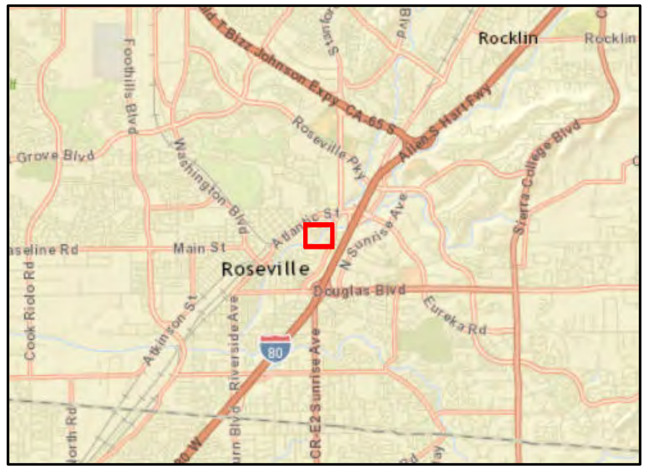
🟨	Ephemeral Drainage	0.016 ac.
🟦	Perennial Creek/Stream	0.176 ac.
	Total: 0.192 ac.	

[1] *Based on exhibit provided by Hatch Mott MacDonald. Boundary represents only an area surveyed and not a legal boundary.*

[2] *Subject to U.S. Army Corps of Engineers verification*
This exhibit depicts information and data produced in strict accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

[3] *The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



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2015-020 Shadowbrook Lift Station and Force Main Project

Scale in Feet
0 150

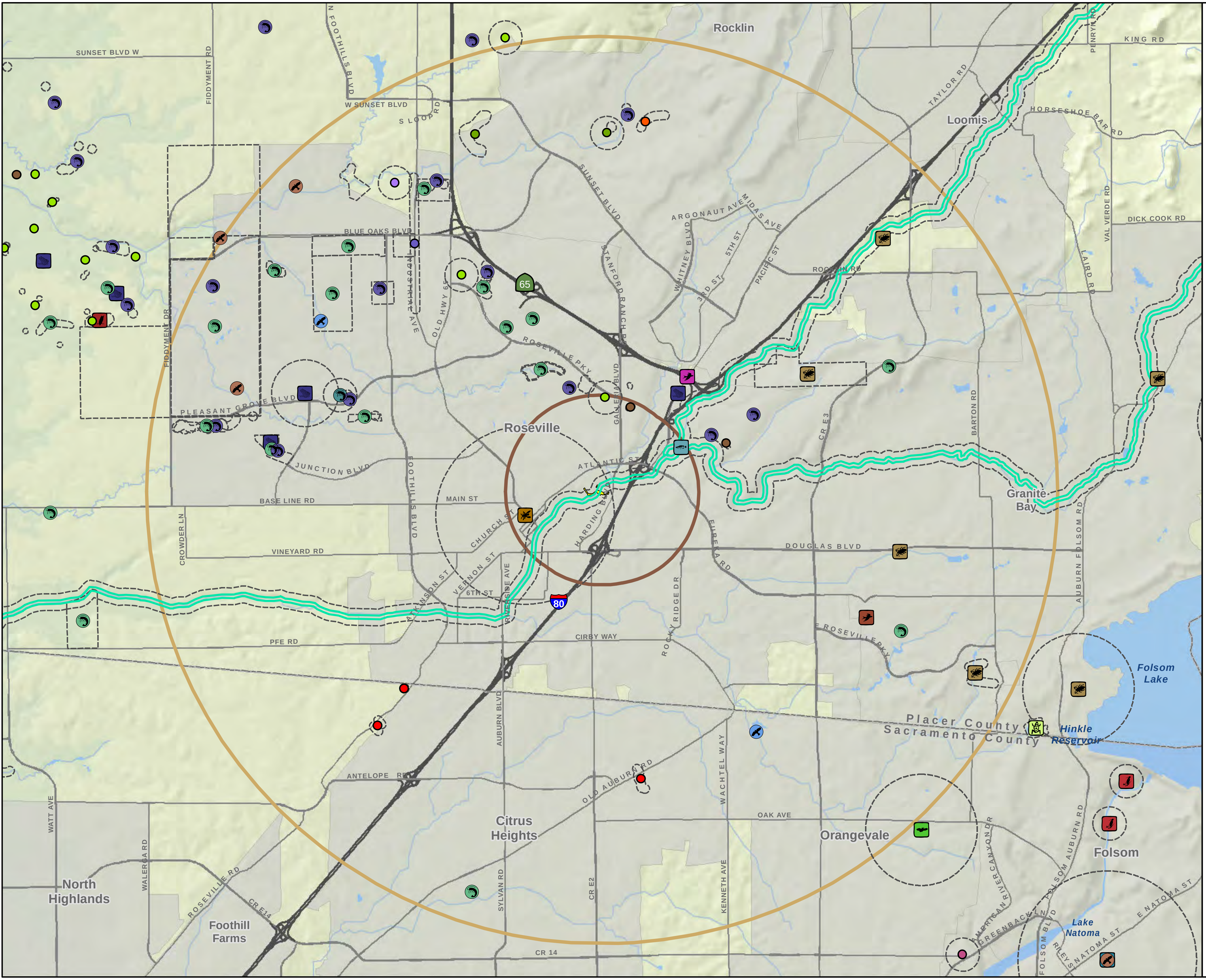
N

Photo Source: USGS 2013
Delineators: K. Kwan
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

Map Date: 11/17/2015

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Wetland_Mapping\Wetland_Delineation\v1\Shadowbrook_WDv1_11X17.mxd (JDS)-KOrtega 11/17/2015

Figure 4.
CNDDB Occurrences of Special-Status Species



Distance From Project

- 1 mile
- 5 miles

Boundaries

- 🟨 Project Boundary [1]

CNDDB Occurrences [2]

- CNDDB Polygon Extent

Plants

- ● Big-scale Balsamroot
- ● Dwarf Downingia
- ● Boggs Lake Hedge-hyssop
- ● Hispid Salty Bird's-beak
- ● Red Bluff Dwarf Rush
- ● Legenere
- ● Sacramento Orcutt Grass
- ● Sanford's Arrowhead

Fish

- Summer-run Steelhead Trout

Invertebrates

- Vernal Pool Fairy Shrimp
- An Andrenid Bee
- California Linderiella
- Vernal Pool Tadpole Shrimp
- Valley Elderberry Longhorn Beetle

Amphibians/Reptiles

- Western Spadefoot
- Western Pond Turtle

Birds

- Great Blue Heron
- Swainson's Hawk
- White-tailed Kite
- California Black Rail*
- Burrowing Owl
- Purple Martin
- Tricolored Blackbird

Mammals

- Pallid Bat
- Silver-haired Bat

Critical Habitat

- Steelhead

This map may include multiple species' occurrences at each location, some of which may not be visible on this graphic. Species occurrences depicted on this map only include special-status plant and animal species as defined in the accompanying report. The CNDDB occurrences shown may not reflect the actual location of the occurrence.

** Species occurrence is represented solely by a polygon. The centroid point is not visible within the map extents.*

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[1] Project Boundary: Hatch Mott MacDonald

[2] CDFW California Natural Diversity Database (CNDDB), June 2015 (GIS Shapefile)

[3] NOAA/NMFS Final Salmonid Critical Habitat (June 2005)

CNDDB Occurrences Located on USGS 7.5' Quadrangles: Citrus Heights, Folsom, Pleasant Grove, Rio Linda, Rocklin, Roseville

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Map Date: 11/17/2015

2015-020 Shadowbrook Lift Station and Force Main Project

Miles
0 1 2

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\SS_Survey_and_Mapping\CNDDB\Shadowbrook_CNDDB_20150805.mxd (ELL)-KOrtega 11/17/2015

Table 1. *Potentially Occurring Special-Status Species* lists all of the plant and wildlife species identified in the literature search as potentially occurring within the Project site and the vicinity. Included in this table are the listing status for each species, a brief habitat description, and a determination of the potential to occur on the Project site.

Table 1. Potentially Occurring Special-Status Species

Common Name *(Scientific Name)*	Status			Habitat Description	Approximate Survey Dates	Potential To Occur On-Site
	ESA	CESA	Other			
Plants						
Big-scale balsamroot *(Balsamorhiza macrolepis)*	-	-	1B.2	Sometimes on serpentine soils in chaparral, cismontane woodland, and valley and foothill grassland, (295' - 5,102')	March-June	Low potential to occur – highly maintained/ disturbed grassland habitat.
Hispid bird's-beak *(Chloropyron molle* ssp. *Hispidum)*	-	-	1B.1	Alkaline meadows and seeps, playas, and valley and foothill grassland (3' - 509')	June-September	Absent – No habitat.
Dwarf downingia *(Downingia pusilla)*	-	-	2B.2	Vernal pools and mesic areas in valley and foothill grassland (3' - 1,460')	March-May	Absent – No habitat.
Boggs Lake hedge-hyssop *(Gratiola heterosepala)*	-	CE	1B.2	Clay soils in vernal pools and in marshes and swamps on lake margins (33' - 7,792')	April-August	Absent – No habitat.
Ahart's dwarf rush *(Juncus leiospermus* var. *ahartii)*	-	-	1B.2	Mesic areas in valley and foothill grassland (98' - 751')	March-May	Absent – No habitat.
Red Bluff dwarf rush *(Juncus leiospermus* var. *leiospermus)*	-	-	1B.1	Vernally mesic areas in chaparral, cismontane woodland, valley and foothill grassland, meadows and seeps, and vernal pools (115' - 3,346')	March-June	Absent – No habitat.
Legenere *(Legenere limosa)*	-	-	1B.1	Vernal pools (3' - 2,887')	April-June	Absent – No habitat.
Pincushion navarretia *(Navarretia myersii* ssp. *myersii)*	-	-	1B.1	Vernal pools, often on acidic soils (66' - 1,083')	April-May	Absent – No habitat.
Sacramento Orcutt grass *(Orcuttia viscida)*	FE	CE	1B.1	Vernal pools (98' - 328')	April-September	Absent – No habitat.
Sanford's arrowhead *(Sagittaria sanfordii)*	-	-	1B.2	Assorted shallow freshwater marshes and swamps (0' - 2,133')	May-November	Low potential to occur – Only if marsh-like area is present along edges of creek.

Table 1. Potentially Occurring Special-Status Species

Common Name *(Scientific Name)*	Status			Habitat Description	Approximate Survey Dates	Potential To Occur On-Site
	ESA	CESA	Other			
Invertebrates						
Conservancy fairy shrimp *(Branchinecta conservatio)*	FE	-	-	Vernal pools/wetlands	November-April	Absent – No habitat.
Vernal pool fairy shrimp *(Branchinecta lynchi)*	FT	-	-	Vernal pools/wetlands	November-April	Absent – No habitat.
Vernal pool tadpole shrimp *(Lepidurus packardi)*	FE	-	-	Vernal pools/wetlands	November-April	Absent – No habitat.
California linderiella *(Linderiella occidentalis)*	-	-	CNDDB	Vernal pools/wetlands	November-April	Absent – No habitat.
An andrenid bee *(Andrena subapasta)*	-	-	CNDDB	Vernal pools/wetlands	n/a	Absent – No habitat.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus)*	FT	-	-	Elderberry shrubs	Any season	Absent – No habitat.
Fish						
Chinook salmon (Central Valley fall/late fall-run ESU) *(Oncorhynchus tshawytscha)*	-	-	NMFS, CSC	Undammed rivers, streams, creeks	n/a	Potential to occur – Suitable migration habitat available.
Steelhead (California Central Valley ESU) *(Oncorhynchus mykiss)irideus*	FT	-	-	Undammed rivers, streams, and creeks	n/a	Potential to occur – Suitable migration habitat available. Critical habitat for this species occurs within Dry Creek.
Delta Smelt *(Hypomesus transpacificus)*	FT	CE	-	Sacramento-San Joaquin Delta	n/a	Absent – No habitat.
Amphibians						
California red-legged frog *(Rana draytonii)*	FT	-	CSC	Occurs in lowlands or foothills at waters with dense shrubby or emergent riparian vegetation. Larvae require 11 to 20 weeks to transform, sometimes overwintering. Adults must have aestivation habitat to endure summer dry down.	February-April	Absent – No habitat due to high velocity and scouring flows during breeding season.

Table 1. Potentially Occurring Special-Status Species

Common Name *(Scientific Name)*	Status			Habitat Description	Approximate Survey Dates	Potential To Occur On-Site
	ESA	CESA	Other			
Western spadefoot *(Spea hammondii)*	-	-	CSC	A California endemic species of vernal pools, swales, wetlands and adjacent grasslands throughout the Central Valley.	March-May	Absent – No habitat.
Reptiles						
Western pond turtle (*Actinemys marmorata marmorata)*	-	-	CSC	The only extant freshwater turtle in California. The northwestern and southwestern subspecies intergrade in central California. This turtle requires basking sites and upland habitats up to 0.5 KM from water for egg laying. Uses ponds, streams, detention basins, and irrigation ditches.	April-October	Potential to occur – Suitable habitat available.
Giant garter snake *(Thamnophis gigas)*	FT	CT	-	A large, aquatic snake of freshwater ditches, sloughs, and marshes in the Central Valley. Almost extinct from the southern parts of its range.	April-October	Absent – No habitat and never observed in Placer County.
Birds						
Great blue heron (nesting colony) *(Ardea herodias)*	-	-	CNDDB	Colonial nester; Prefers to nest in vegetation on islands or in swamps but may also be found in upland habitats in trees, bushes, on the ground and on artificial structures. Foraging habitat is widely diverse and includes swamps, coastlines, estuaries, beaches, pastures, cultivated fields, and riparian areas.	February-July	Absent – No suitable nesting or foraging habitat present.
Cooper's hawk *(Accipiter cooperii)*	-	-	CNDDB	Nests in trees in riparian woodlands in deciduous, mixed and evergreen forests, as well as urban landscapes.	April-July	Present – Observed during site visit.
White-tailed Kite *(Elanus leucurus)*	-	-	CFP	Breeding occurs within trees in low elevation grassland, agricultural, wetland, oak woodland, riparian, savannah, and urban habitats.	March-June	Potential to occur – Suitable nesting habitat available.
Bald eagle (nesting and wintering) *(Haliaeetus leucocephalus)*	Delisted	CE	CFP, BCC	Typically breeds in forested areas near large bodies of water in the northern half of California; they nest in trees and rarely on cliffs usually absent of human	Nests (February-July); winters CV (October-March)	Absent – No suitable nesting or foraging habitat present.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description	Approximate Survey Dates	Potential To Occur On-Site
	ESA	CESA	Other			
Swainson's hawk *(Buteo swainsoni)*	-	CT	BCC	Nesting occurs in trees in agricultural, riparian, oak woodland, scrub, and urban landscapes. Forages over grassland, agricultural lands, particularly during disking/harvesting, irrigated pastures.	March-August	Low potential to occur – Suitable nesting habitat present, but no foraging habitat in vicinity.
California Black rail *(Laterallus jamaicensis coturniculus)*	-	CT	BCC, CFP	Salt marsh, shallow freshwater marsh, wet meadows, and flooded grassy vegetation. In California, primarily found in coastal and Bay-Delta communities, but also in Sierran foothills (Butte, Yuba, Nevada, Placer counties)	March-July	Absent – No suitable habitat present.
Western snowy plover *(Charadrius alexandrinus nivosus)*	FT	-	BCC, CSC	Nests on the ground, on open sandy coastal beaches, barrier islands, barrens shores of inland saline lakes, on river bars, and man-made ponds such as wastewater ponds, dredge spoils, and salt evaporation ponds.	March-September	Absent – No suitable habitat present.
Burrowing owl (burrow sites) *(Athene cunicularia)*	-	-	BCC, CSC	Breeds in burrows or burrow surrogates in open, treeless, areas within grassland, steppe, and desert biomes. Often with other burrowing mammals (e.g. prairie dogs, California ground squirrels). May also use human-made habitat such as agricultural fields, golf courses, cemeteries, roadside, airports, vacant urban lots, and fairgrounds.	March-August	Absent – No suitable habitat present.
Short-eared owl (nesting) *(Asio flammeus)*	-	-	CSC	Nests in large expanses of prairie, coastal grasslands, heathlands, shrub-steppe, tundra, and agricultural areas.	March-July (nesting)	Absent – No suitable habitat present.
Costa's hummingbird *(Calypte costae)*	-	-	BCC	In California, breeds in coastal scrub and chaparral communities from Santa Barbara Co. south into Baja California; from Mexico north into Mojave desert scrub of Eastern Sierra Nevada;	February-June	Absent – Not in nesting range of species.

Table 1. Potentially Occurring Special-Status Species

Common Name *(Scientific Name)*	Status			Habitat Description	Approximate Survey Dates	Potential To Occur On-Site
	ESA	CESA	Other			
Williamson's sapsucker *(Sphyrapicus thyroideus)*	-	-	BCC	In California, breeds in the Cascade-Sierra Nevada region; with disjunct breeding populations in San Gabriel, San Bernardino, and San Jacinto Mountains; Siskiyou, Trinity and Warner Mountains; East Warner Mountains, Sweetwater and Carson Range. Breeding occurs in middle to high elevation conifer and mixed conifer-deciduous forests. Nesting habitat cavities excavated in western larch, Douglas fir, ponderosa pine, montane spruce, and quaking aspen.	May-July	Absent – Not in nesting range of species.
Lewis' woodpecker (nesting) *(Melanerpes lewis)*	-	-	BCC	In California, breeds in Siskiyou and Modoc Counties, Warmer Mountains, Sierra Nevada, inner coast ranges from Tehama to San Luis Obispo Counties, San Bernardino Mountains, and Big Pine Mountain (Inyo Co.).; nesting habitat includes open ponderosa pine forest, open riparian woodland, logged/burned forest, and oak woodlands.	May-July	Absent – Not in nesting range of species.
Nuttall's woodpecker *(Picoides nuttallii)*	-	-	BCC	Resident from northern California south to Baja California. Nests in tree cavities in oak woodlands and riparian woodlands.	April-July	Present – Observed during site visit.
American peregrine falcon (nesting) *(Falco peregrinus anatum)*	Delisted	Delisted	BCC, CFP	In California, breeds in coastal region, northern California, and Sierra Nevada. Nesting habitat includes cliff ledges and human-made ledges on towers and buildings. Wintering habitat includes areas where there are large concentrations of shorebirds, waterfowl, pigeons or doves.	October-March	Absent – No suitable nesting or foraging habitat present.
Loggerhead shrike *(Lanius ludovicianus)*	-	-	BCC, CSC	Found throughout California in open county with short vegetation, pastures, old orchards, grasslands, agricultural areas, open woodlands. Not found in heavily forested habitats.	March-July	Absent – No suitable nesting or foraging habitat present.

Table 1. Potentially Occurring Special-Status Species

Common Name *(Scientific Name)*	Status			Habitat Description	Approximate Survey Dates	Potential To Occur On-Site
	ESA	CESA	Other			
Yellow-billed magpie (nesting) *(Pica nuttallii)*	-	-	BCC	Endemic to California; found in the Central Valley and coast range south of San Francisco Bay and north of Los Angeles County.; nesting habitat includes oak savannah with large in large expanses of open ground; also found in urban parklike settings.	April-June	Potential to occur – Suitable nesting habitat available.
Purple martin (nesting) *(Progne subis)*	-	-	CSC	In California, breeds along coast range, Cascade-northern Sierra Nevada region and isolated population in Sacramento. Nesting habitat includes montane forests, Pacific lowlands with dead snags; the isolated Sacramento population nests in weep holes under elevated highways/bridges. Winters in South America.	April-August	Absent – No suitable nesting habitat present.
Oak titmouse *(Baelophus inornatus)*	-	-	BCC	Nests in tree cavities within dry oak or oak-pine woodland and riparian; where oaks are absent, they nest in juniper woodland, open forests (gray, Jeffrey, Coulter, pinyon pines and Joshua tree)	March-July	Present – Observed during site visit.
Fox sparrow *(Passerella iliaca)*	-	-	BCC	*Megarhyncha* group breeds in SW Oregon south the central Northern California (Del Norte/Siskiyou Cos.) and Sierra Nevada south to Fresno/Inyo Cos. Several subspecies winter throughout California. Wintering habitat includes riparian with thick cover and underbrush, chaparral with thick, tall vegetation.	Breeding (May-July), wintering (September-April)	Absent – Not in nesting range of species.
Tricolored blackbird *(Agelaius tricolor)*	-	CT	CSC	Emergent marsh, riparian woodland/scrub, blackberry thickets, densely vegetated agricultural and idle fields	April-June	Absent – No suitable nesting or foraging habitat present.
Mammals						
Pallid bat *(Antrozous pallidus)*	-	-	CSC	Mines, man-made structures, rock outcrops, and woodland near open grasslands for foraging	April-September	Low potential to occur – minimal foraging habitat present.

Table 1. Potentially Occurring Special-Status Species

Common Name *(Scientific Name)*	Status			Habitat Description	Approximate Survey Dates	Potential To Occur On-Site
	ESA	CESA	Other			
Townsend's big-eared bat (*Corynorhinus townsendii)*	-	CPT	CSC	Caves, mines, bridges, and buildings, sometimes trees.	April-September	Low potential to occur – Preferred roosting habitat not present.

Status Codes:

FE	- Federal ESA listed, Endangered.
FT	- Federal ESA listed, Threatened.
FPT	- Formally Proposed for federal ESA listing as Threatened.
BCC	- U. S. Fish and Wildlife Service Bird of Conservation Concern (USFWS, 2002).
CE	- California ESA or Native Plant Protection Act listed, Endangered.
CT	- California ESA or Native Plant Protection Act listed, Threatened.
CPT	- California ESA Proposed for state listing as Threatened.
CR	- California ESA or Native Plant Protection Act listed, Rare.
CFP	- California Fish and Game Code Fully Protected Species (§3511-birds, §4700-mammals, §5050-reptiles/amphibians).
X	- Critical Habitat designated for this species.
CSC	- California Department of Fish and Game Species of Special Concern (CDFG, updated August 2004).
1B	- California Rare Plant Rank/Rare or Endangered in California and elsewhere.
2	- California Rare Plant Rank/Rare or Endangered in California, more common elsewhere.
0.1	- California Rare Plant Rank, Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
0.2	- California Rare Plant Rank, Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat)
CNDDB	- California Natural Diversity Database

4.6.1 Plants

Ten special-status plant species were identified as having the potential to occur in the Project site and the vicinity based on the literature review (Table 1). However, upon further analysis and after the site visit, eight species were considered to be absent from the site due to the lack of suitable habitat or because the site is outside the range for the species. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining two species that have the potential to occur within the Project site are presented below.

Big-scale balsamroot

Big-scale balsamroot (*Balsamorhiza macrolepis*) is not listed pursuant to either CESA or FESA; however, it is designated as a CRPR 1B.2 species. This species is sometimes found within serpentine soils in chaparral, cismontane woodland, and valley and foothill grassland habitats. Big-scale balsamroot is a perennial herb that flowers between the months of March and June and is known to occur at elevations ranging from 295 to 5,102 feet above MSL (CNPS 2015). Big-scale balsamroot is endemic to California; the current range of this species includes Alameda, Amador, Butte, Colusa, El Dorado, Lake, Mariposa, Napa, Placer, Santa Clara, Shasta, Solano, Sonoma, Tehama, and Tuolumne counties (CNPS 2015).

The annual grassland habitat on the site is highly maintained and disturbed, which likely precludes the presence of this species. However, there is a limited amount of this habitat that is scattered throughout the site which may provide suitable habitat for the big-scale balsamroot. This species is sometimes found in serpentine soils which were not observed on-site. Therefore, the annual grassland provides marginal habitat for this species and it is considered to have a low potential to occur on-site.

Sanford's arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is not listed pursuant to either CESA or FESA, but is designated as a CNPS List 1B.2 species. This species is a perennial rhizomatous herb that occurs in marshes and swamps and assorted shallow freshwater (CNPS 2015). Sanford's arrowhead blooms from May through November and is known to occur from 0 to 2,133 feet above MSL (CNPS 2015). Sanford's arrowhead is endemic to California; the current range of this species includes Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Orange, Placer, Sacramento, San Bernardino, Shasta, San Joaquin, Solano, Tehama, Ventura, and Yuba counties (CNPS 2015).

Marsh-like conditions present along any of the edges of the creek may provide suitable habitat for this species. However, there is low potential for this habitat to occur on the site. Sanford's arrowhead is considered to have low potential to occur on-site.

4.6.2 Invertebrates

Six special-status invertebrate species were identified as having the potential to occur on the Project site and the vicinity based on the literature review (Table 1). However, upon further analysis and after the site visits, these species were considered to be absent from the site due to lack of suitable habitat.

4.6.3 Fish

Three special-status fish species were identified as having potential to occur on the Project site and the vicinity based on the literature review (Table 1). However, upon further analysis and after the site visit, one species, Delta smelt, was considered to be absent from the site due to lack of suitable habitat. No further discussion is provided in this analysis. A brief description of the Central Valley fall/late fall-run Chinook salmon and Central Valley Steelhead that have potential to occur within the Project site are presented below.

Chinook Salmon (Central Valley fall/late fall-run ESU)

Chinook salmon (*Oncorhynchus tshawytscha*) have four distinct runs in the Sacramento-San Joaquin River Systems during each year. Of the four, the Central Valley fall/late-fall run is considered a species of special concern, while the winter run is considered endangered and the spring run is considered threatened. Habitat for Central Valley fall/late-fall run chinook salmon includes freshwater rivers and streams that are tributaries to the Sacramento and San Joaquin River systems as well as the rivers themselves. While the timing of runs vary from stream to stream, adult fall-run Chinook generally migrate upstream from July through December and spawn from early October through late December, and late fall-run Chinook generally migrate into the rivers from mid-October through December and spawn from January through mid-April. Spawning usually takes place in shallow riffles in suitable gravel deposits. The majority of young Central Valley fall/late-fall run migrate to the ocean during the first few months following emergence. Some, however, may remain in fresh water and migrate as yearlings. Central Valley fall/late fall-run Chinook salmon are known to utilize Dry Creek as upstream migrating adults and as downstream out-migrating juveniles. As such, this species is considered to potentially occur within the project area.

Steelhead (California Central Valley ESU)

Central Valley steelhead (*Oncorhynchus mykiss*) is listed as a federally threatened species and is also listed as threatened by the American Fisheries Society. Habitat for Central Valley steelhead includes freshwater rivers and streams that are tributaries to the Sacramento and San Joaquin River systems. The Central Valley steelhead run can occur from July through May and primarily occurs from December through April with peaks in September and February. Spawning takes place in shallow swift moving riffles with small gravel and cobble as the primary substrate needed for spawning. Young steelhead may spend from one to three years in freshwater prior to migrating to the ocean, with most fish emigrating during the spring when smoltification occurs. Emigrating Central Valley steelhead are known to use the lower reaches of the Sacramento River and the Delta for rearing and as a migration corridor to the ocean.

Critical Habitat for Central Velley steelhead occurs within the proposed project area. Critical Habitat was designated for Central Valley steelhead on 2 September 2005 (70 FR 52488) and includes all or portions of the following counties: Tehama, Butte, Glenn, Shasta, Yolo, Sacramento, Solano, Yuba, Sutter, Placer, Calaveras, San Joaquin, Stanislaus, Tuolumne, Merced, Alameda, and Contra Costa. In general, Critical Habitat includes the stream channels to the ordinary high water line within designated stream reaches of:

- the American (including Dry Creek), Feather, and Yuba rivers;
- the Deer, Mill, Battle, Antelope, and Clear creeks in the Sacramento River basin;
- the Calaveras, Mokelumne, Stanislaus, and Tuolumne rivers in the San Joaquin River basin;
- the Sacramento and San Joaquin rivers and
- the entire Delta.

Central Valley steelhead are known to utilize Dry Creek as upstream migrating adults and as downstream out-migrating juveniles. As such, this species is considered to potentially occur within the project area. Furthermore, construction of the project may adversely affect or modify designated Critical Habitat which occurs on site.

4.6.4 Amphibians

Two special-status amphibian species (California red-legged frog and western spadefoot) were identified as having the potential to occur in the Project site and the vicinity based on the literature review (Table 1). However, upon further analysis and after the site visit, these species were considered to be absent from the site due to lack of suitable habitat. No further discussion of these species is provided in this analysis.

4.6.5 Reptiles

Two special-status reptile species (western pond turtle and giant garter snake) were identified as having the potential to occur in the Project site and the vicinity based on the literature review (Table 1). However, upon further analysis and after the site visit, one species (giant garter snake) was considered to be absent from the site due to lack of suitable habitat. A brief description of western pond turtle, which has potential to occur within the Project site, is presented below.

Western Pond Turtle

The western pond turtle (*Actinemys marmorata marmorata)* is not listed pursuant to either CESA or FESA; however, it is designated as a CDFG species of special concern. Western pond turtles occur in a variety of fresh and brackish water habitats including marshes, lakes, ponds, and slow moving streams (Jennings and Hayes 1994). This species is primarily aquatic; however, they typically leave aquatic habitats in the fall to reproduce and to overwinter (Jennings and Hayes 1994). Deep, still water with abundant emergent woody debris, overhanging vegetation, and rock outcrops is optimal for basking and thermoregulation. Although adults are habitat generalists, hatchlings and juveniles require specialized habitat for survival through the first few years. Hatchlings require shallow water habitat with relatively dense submergent or short emergent vegetation in which to forage.

Western pond turtles are typically active between March and November. Mating generally occurs during late April and early May and eggs are deposited between late April and early August (Jennings and Hayes 1994). Eggs are deposited within excavated nests in upland areas, with substrates that typically have high clay or silt fractions, usually in the vicinity of aquatic habitats (Jennings and Hayes 1994). The majority of nesting sites are located within 650 feet (200 m) of the aquatic habitat; however, sites have been documented as far as 1,310 feet (400 m) from the aquatic habitat. There is potential for western pond turtle to occur within the site along Dry Creek.

4.6.6 Birds

Twenty special-status bird species were identified as having the potential to occur in the Project site and the vicinity based on the literature review (Table 1). However, upon further analysis and after the site visit, fourteen of these species were considered to be absent from the site due to lack of suitable habitat. No further discussion on this species is provided in this analysis. Brief descriptions of the remaining six species that have the potential to occur or were seen during the site visit within the Project are presented below.

Cooper’s Hawk

The Cooper’s hawk (*Accipiter cooperii*) is not listed pursuant to either CESA or FESA. However, it is a CDFW “watch list” species and is currently tracked in the CNDDB. Typical nesting and foraging habitats include riparian woodland, dense oak woodland, and other woodlands near water. Cooper’s hawk nest throughout California from Siskiyou County to San Diego County, and includes the Central Valley (Rosenfield and Bielefeldt 2006). Breeding occurs during March through August, with a peak from May through July. Cooper’s hawk was observed on-site during the site visit.

White-tailed Kite

White-tailed kite (*Elanus leucurus*) is not listed pursuant to either CESA or FESA; however, the species is fully protected pursuant to Section 3511 of the California Fish and Game Code. This species is a common resident in the Central Valley and the entire length of the California coast, and all areas up to the Sierra Nevada foothills and southeastern deserts (Dunk 1995). In northern California, white-tailed kite nesting occurs from February through early August, with activity peaking from March through June. Nesting occurs in trees within riparian, oak woodland, savannah, and agricultural communities that are near foraging areas such as low elevation grasslands, agricultural, meadows, farmlands, savannahs, and emergent wetlands (Dunk 1995). The nearest documented white-tailed kite nest is within five miles of the Project site (CDFW 2015). White-tailed kite is considered to have potential to occur on-site.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species and is protected pursuant to CESA. This species nests in North America (Canada, western United States, and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta (Bechard et al. 2010). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawks nest within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel (*Otospermophilus beecheyi*), ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanopulus* species). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, disking, and irrigating (Estep 1989). The removal of vegetative cover by such farming activities results in more readily available prey items for this species.

The nearest documented Swainson's hawk nest is within five miles of the Project site (CDFW 2015). While there is suitable nesting habitat on-site, the site does not support suitable foraging habitat. Therefore, Swainson's hawk is considered to have low potential to occur on-site.

Nuttall's Woodpecker

The Nuttall's woodpecker (*Picoides nuttallii*) is not listed and protected under either CESA or FESA, but is considered a USFWS bird of conservation concern. They are resident from Siskiyou County south to Baja California. Nuttall's woodpeckers nest in tree cavities primarily within oak woodlands, but also can be found in riparian woodlands (Lowther 2000). Breeding occurs during March through June. Nuttall's woodpecker was observed on-site during the site visit.

Yellow-billed Magpie

The yellow-billed magpie (*Pica nuttalli*) is not listed pursuant to either CESA or FESA but is considered a USFWS bird of conservation concern. This endemic species is a year-long resident of the Central Valley and Coast Ranges from San Francisco Bay to Santa Barbara County. Yellow-billed magpies build large, bulky nests in trees in a variety of open woodland habitats, typically near grassland, pastures or cropland. Nest building begins in late January to mid-February, and nest building may take up to six to eight weeks to complete (Koenig and Reynolds 2009). The young leave the nest at about 30 days after hatching (Koenig and Reynolds 2009). Yellow-billed magpies are highly susceptible to West Nile virus, which may have been the cause of death to thousands of magpies between 2004-2006 (Koenig and Reynolds 2009). Yellow-billed magpie is considered to have potential to occur on-site.

Oak Titmouse

Oak titmice (*Baeolophus inornatus*) are not listed and protected under either CESA or FESA, but are considered a USFWS bird of conservation concern. Oak titmice are distributed throughout California, excluding the humid northwestern corner, the Great Basin region in the northeastern corner, and the deserts (Cicero 2000). They are found in arboreal vegetation communities that are dominated by oak (*Quercus* species) trees, but may also occur in coniferous and other woodland habitats (Cicero 2000). Oak titmouse was observed on-site during the site visit.

4.6.7 Mammals

Two special-status bat species were identified as having potential to occur in the Project site and the vicinity based on the literature review (Table 1). Brief descriptions of the two species that have the potential to occur within the Project site are presented below.

Pallid Bat

The pallid bat (*Antrozous pallidus*) is a large buff-colored bat, with large ears and broad wings (Orr 1954). The pallid bat occurs throughout the southwestern United States, south into Mexico, and along the Pacific states of California, Oregon, and Washington (Hermanson and O'Shea 1983). This species is found in a variety of habitats including grasslands and oak woodlands (Philpott 1996). This species typically roosts in rock crevices, tree hollows, or various man-made structures such as attics, barns, and bridges (Orr 1954, O'Shea and Vaughan 1977, Lewis 1994, Philpott 1996). Pallid bats are primarily insectivores and feed by gleaning prey items from the ground or off vegetation (Bell 1982). Orr (1954) described the seasonal behavior of pallid bats. The dormancy period ends in late March or early April. Pallid bats are gregarious in the spring and summer months, forming colonies of approximately 30-100 individuals. Females typically give birth in May and June to twins (mean of 1.8 young per female). Colony size decreases during the fall, and by October the bats move to winter locations.

The pallid bat is listed as a state species of special concern (CDFW 2015). In addition, the Western Bat Working Group (WBWG) has classified the pallid bat in California as "imperiled or are at high risk of imperilment" (WBWG 2015). The main threats to this species are loss of oak woodland and other forest habitat, along with roost disturbance resulting in roost abandonment. The current state and WBWG status level reflects significant population declines occurring within the north Coast range. The status of the Central Valley pallid populations is not known. The pallid bat is considered to have potential to occur on-site within the trees and building on the site.

Townsend's Big-eared Bat

The Townsend's big-eared bat (*Corynorhinus townsendii*) occurs throughout California and is considered a cave obligate species. Although they will occasionally use a tree as a roost, this species prefers caves, mines, bridges, or buildings for roost sites. They are particularly sensitive to disturbance and may abandon a roost site permanently after only one slight human disturbance (e.g., humans walking into a cave or mine). Townsend's big-eared bats will roost alone or in groups of 15-100 individuals. They feed primarily on moths and prefer to forage along the edge of clumps of native vegetation. They are year-round residents in California and, while they hibernate during the winter, they do occasionally forage during the winter months (Kunz and Martin 1982, Philpott 1996).

The Townsend's big-eared bat is listed as a state candidate for potential listing as threatened (CDFW 2015). In addition, the WBWG has classified the Townsend's big-eared bat in California as "imperiled or are at high risk of imperilment" (WBWG 2015). The main threats to this species are closure of mines and caves, along with roost disturbance resulting in roost abandonment. Of all the bats in northern California, this one is considered the most imperiled. Townsend's big-eared bat is considered to have low potential to roost in the trees on-site.

4.7 Wildlife Movement/Corridors

The Project site is located within a riparian corridor between residential neighborhoods and is in close proximity to residences and human presence. While evidence of human presence is found throughout the area, including an existing paved bike trail, unpaved/unimproved walking and off-road bicycle trails and trash, the site is considered a wildlife movement corridor for a variety of terrestrial and aquatic wildlife species. Dry Creek provides a movement corridor for anadromous fish species such as Central Valley steelhead and fall run/late fall-run Chinook salmon, and allow for other aquatic species, such as native warm water fish species, river otters, and turtles to migrate through the project area. The construction footprint will be restored to pre-project conditions upon completion, so the Project will result in temporary impacts to potential wildlife movement within the vicinity of the Project.

5.0 RECOMMENDATIONS

5.1 Waters of the U.S.

As previously described in section 4.5, Dry Creek and an ephemeral drainage run through the Project site. These features appear to be jurisdictional; however, the jurisdictional determination is ultimately the responsibility of the USACE. It is recommended that the Applicant perform a wetland delineation according to USACE survey protocol and submit a wetland delineation report to USACE for verification. This would be consistent with the City of Roseville BMP-8.

5.2 City of Roseville Tree Ordinance

An arborist survey was completed for the Project area and included several native oak trees, with 6 inches or greater DBH, that are regulated under the City of Roseville Tree Ordinance. The proposed project would likely result in the removal of one regulated native Valley oak tree, totaling 10 inches

DBH, and may impact the protected zone radius of 13 regulated native oak trees (four Valley oaks and nine interior live oaks), totaling 178 inches DBH. The following measures are recommended to address potential impacts to regulated native oak trees:

- Per the City of Roseville Mitigating Ordinances, Guidelines, and Standards and BMP-10, a City permit application will be prepared and the Applicant will comply with mitigation measures stipulated in the City tree permit.

5.3 Special-Status Species

Three special-status birds were observed on the site during the site visit and there is suitable habitat or marginally suitable habitat within the Project site for two special-status plants, two special-status fish, one special-status reptile, six special-status birds, and three special-status mammals. A brief discussion of recommendations is presented below for each group.

5.3.1 Plants

Two special-status plant species, big-scale balsamroot and Sanford's arrowhead, have potential to occur within the Project site and, if present, may be impacted by the Project. The following measures are recommended:

A. Perform focused plant surveys according to USFWS, CDFW, and CNPS protocol. Surveys will be timed according to the blooming period for target species and known reference populations, if available, and/or local herbaria will be visited prior to surveys to confirm the appropriate phenological state of the target species

B. The USFWS generally considers plant survey results valid for approximately three years. Therefore, follow-up surveys may be necessary if Project implementation occurs after this three-year window.

C. If special-status plant species are found, avoidance zones may be established around plants to clearly demarcate areas for avoidance. Avoidance measures and buffer distances may vary between species and the specific avoidance zone distance will be determined in coordination with appropriate resource agencies (CDFW and USFWS).

D. If special-status plant species are found within the Project area and avoidance of the species is not possible, additional measures such as seed collection and/or translocation may be developed in consultation with the appropriate agencies.

E. If no special-status plants are found, no further measures pertaining to special-status plants are necessary.

5.3.2 Invertebrates

- There are no potential special-status invertebrates within the Project site.

5.3.3 *Special-Status Fish*

To prevent take of any special-status fish species protected under FESA, the Applicant will consult with NMFS pursuant to Section 7 of FESA. A formal BA is being prepared to address any potential adverse effects to federally listed fish species arising from implementation of the proposed project. This document will also address any effects on Critical Habitat and shall be submitted as part of the permitting process. The BA shall be the primary support document for FESA consultation and, once issued, the Proposed Project shall comply with all conditions of the BO from NMFS. These conditions will include mitigation measures to minimize the incidental take of special status fish species such as the threatened Central Valley steelhead and to minimize activities that would adversely affect or modify Critical Habitat. These measures may include but are not necessarily limited to construction timing windows, implementation erosion control and turbidity measures, training of construction crews, and on-site monitoring and reporting. Additional avoidance and minimization measures will be implemented consisted with to the City of Roseville BMP-4.

5.3.4 *Special Status Reptiles*

Dry Creek supports suitable western pond turtle habitat. To date, no surveys for this species have been performed on-site. The following measures, in compliance of the City of Roseville BMP-6, are recommended to reduce potential impacts:

- Conduct a pre-construction survey for western pond turtle. The survey should be performed within 48 hours prior to the start of construction.
- If no western pond turtles are found, no further measures pertaining to this species are necessary.
- If western pond turtles are found within an area proposed for impact, a qualified biologist shall relocate the western pond turtle to a suitable location away from the proposed construction, in consultation with CDFW.

5.3.5 *Special-Status Birds and MBTA Protected Birds*

Suitable nesting and/or wintering and foraging habitat for six special-status birds is present within the Project site. These include Cooper's hawk, white-tailed kite, Swainson's hawk, Nuttall's woodpecker, yellow-billed magpie (nesting), and oak titmouse. If present, the Project could result in harassment to nesting individuals and may temporarily disrupt foraging activities. In addition to the above listed special-status birds, all native birds, including raptors, are protected under the California Fish and Game Code and the Federal MBTA. As such, to ensure that there are no impacts to protected active nests, the following measures, which are consistent with the City of Roseville dBMP-7, are recommended:

A. Conduct a pre-construction clearance survey for nesting birds within all suitable habitats on the Project site within 14 days (30 days for raptor nesting) of the commencement of construction. The bird survey will be conducted if construction begins during the nesting season (1 February – 31 August), and will extend at least 500 feet beyond the Project boundary. Pre-construction nesting bird surveys are not required for construction activity outside the nesting season.

1. If active nests are found, a no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with CDFW. Identified nests shall be continuously surveyed for the first 24 hours prior to any construction-related activities to establish a behavioral baseline and the nests shall continue to be monitored to detect any behavioral changes. If behavioral changes are observed, work that is causing the behavioral change shall halt until consultation with CDFW. The buffer shall be maintained until the fledglings are capable of flight and become independent of the nest tree, as determined by a qualified biologist. Once the young are independent of the nest, no further measures are necessary. Pre-construction nesting surveys are not required for construction activity outside the nesting season. Additionally, all vertical pipes and fencing poles should be capped to prevent bird death and injury and no pesticides or rodenticides shall be used on the project site.

B. The Project site supports nesting habitat for Swainson's hawk. If required by the CEQA Lead Agency, surveys for Swainson's hawk may be conducted out to 0.5 mile beyond the Project boundary and performed according to the Recommended Timing and Methodology for Swainson's hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000).

Other special-status birds identified as potentially occurring are migrants and/or wintering species. These species do not nest in this region. Therefore, no surveys for wintering and migrant species are recommended.

5.3.6 Mammals

Habitat is present on-site for two special status bats, including the pallid bat and Townsend's big-eared bat.

- Conduct a pre-construction clearance survey within 14 days of the start of project construction. If roosting bats are found, consult with CDFW to implement appropriate measures (e.g., avoidance, construction monitoring, roost exclusion).

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LIST OF ATTACHMENTS

Attachment A – Representative Site Photos

Attachment B – Shadowbrook Force Main and Lift Station Project Arborist Survey Inventory

Attachment C – Shadowbrook Tree Location Overview & Map

ATTACHMENT A

Representative Site Photos

Existing pump station, with adjacent apartments.

Location along Shadow Ridge through apartment complex.

Dry Creek floodplain, looking west.

Dry Creek, looking northeast.

Representative Site Photos

2015-020 Shadowbrook Lift Station and Force Main Project

ATTACHMENT B

Shadowbrook Force Main and Lift Station Project Arborist Survey Inventory

Shadowbrook Force Main and Lift Station Project Arborist Survey
June 29, 2015

Tag Number	Common Name	Scientific Name	Nativity	Aggregate DBH (inches)	Number of Stems	All Trunks DBH (inches)	Dripline Radius (feet)	Structure**	Condition**	Comment	Latitude N	Longitude W
99	Aleppo Pine	*Pinus halepensis*	Non-native	24.0	1		39.0	Fair	Fair	no original tag	38.753269142	-121.268669589
1190	Aleppo Pine	*Pinus halepensis*	Non-native	26.0	1		33.0	Fair	Fair	no original tag	38.753326671	-121.268147418
711	Black Walnut	*Juglans californica*	Native	7.0	1		18.0	Fair	Fair	no original tag	38.754486441	-121.270257953
83	Blue Oak	*Quercus douglasii*	Native	14.0	1		24.0	Fair	Fair	no original tag	38.753249551	-121.268818405
87	Blue Oak	*Quercus douglasii*	Native	15.0	1		24.0	Good	Fair	no original tag	38.753258386	-121.269068903
89	Blue Oak	*Quercus douglasii*	Native	23.0	1		39.0	Fair	Fair	no original tag	38.753326282	-121.269160810
709	Blue Oak	*Quercus douglasii*	Native	24.0	1		39.0	Fair	Fair	no original tag	38.754513323	-121.270452785
84	Blue Oak	*Quercus douglasii*	Native	25.0	2	10, 15	30.0	Fair	Fair	no original tag	38.753271682	-121.268856948
708	Blue Oak	*Quercus douglasii*	Native	28.0	1		36.0	Fair	Fair	no original tag	38.754560417	-121.270402157
no tag*	Blue Oak	*Quercus douglasii*	Native	40.0	1		36.0	Fair	Fair	on private property, canopy overhang. dbh approx.	38.754441604	-121.270571346
98	Chinese Hackberry	*Celtis sinensis*	Non-native	6.0	1		18.0	Fair	Poor	no original tag	38.753263059	-121.268752385
96	Chinese Hackberry	*Celtis sinensis*	Non-native	9.0	1		18.0	Fair	Fair	no original tag	38.753050229	-121.268947487
1191	Chinese Hackberry	*Celtis sinensis*	Non-native	10.0	1		21.0	Poor	Fair	no original tag	38.753282411	-121.268091368
97	Chinese Hackberry	*Celtis sinensis*	Non-native	11.0	1		18.0	Fair	Fair	no original tag	38.753022313	-121.268907208
1197	Chinese Hackberry	*Celtis sinensis*	Non-native	18.0	1		21.0	Fair	Poor	no original tag	38.753327244	-121.267961178
1181	Chinese Privet	*Ligustrum sinense*	Non-native	6.0	1		15.0	Fair	Fair	no original tag	38.753108322	-121.269497825
2919	Chinese Privet	*Ligustrum sinense*	Non-native	12.0	4	3, 1, 4, 4	15.0	Poor	Poor	no original tag	38.752955877	-121.270072370
1195	Crapemrytle	*Lagerstroemia indica*	Non-native	7.0	1		18.0	Good	Good	no original tag	38.753281549	-121.267813449
1196	Crapemrytle	*Lagerstroemia indica*	Non-native	8.0	1		21.0	Good	Good	no original tag	38.753268870	-121.267872258
1194	Crapemrytle	*Lagerstroemia indica*	Non-native	9.0	1		21.0	Fair	Good	no original tag	38.753296359	-121.267771461
2910	Fremont's Cottonwood	*Populus fremontii*	Native	17.0	1		24.0	Poor	Poor	1165, tag gone	38.753514136	-121.270360729
1154	Fremont's Cottonwood	*Populus fremontii*	Native	17.5	1		13.0	Good	Good		38.753488781	-121.270793302
1144	Fremont's Cottonwood	*Populus fremontii*	Native	18.0	1		24.0	Fair	Fair		38.753473285	-121.269610464
1143	Fremont's Cottonwood	*Populus fremontii*	Native	19.0	1		27.0	Fair	Fair		38.753426811	-121.269696126
1117	Fremont's Cottonwood	*Populus fremontii*	Native	27.0	1		51.0	Poor	Fair		38.753187802	-121.269829907
1125	Fremont's Cottonwood	*Populus fremontii*	Native	34.0	1		39.0	Fair	Poor		38.753435148	-121.270306112
1140	Fremont's Cottonwood	*Populus fremontii*	Native	49.0	1		48.0	Poor	Fair		38.753309308	-121.269773462
2903	Interior Live Oak	*Quercus wislizeni*	Native	6.0	1		21.0	Poor	Poor	no original tag	38.753520807	-121.269618915
2916	Interior Live Oak	*Quercus wislizeni*	Native	6.0	1		27.0	Poor	Fair	no original tag	38.752959035	-121.270199637
2902	Interior Live Oak	*Quercus wislizeni*	Native	8.0	1		18.0	Poor	Poor	no original tag	38.753540386	-121.269621606
1145	Interior Live Oak	*Quercus wislizeni*	Native	9.0	1		18.0	Fair	Fair		38.753463651	-121.269685441
1199	Interior Live Oak	*Quercus wislizeni*	Native	9.0	1		21.0	Fair	Fair	no original tag	38.753118224	-121.268451618
2904	Interior Live Oak	*Quercus wislizeni*	Native	9.0	2	5, 4	24.0	Poor	Fair	no original tag	38.753485947	-121.269651673
2905	Interior Live Oak	*Quercus wislizeni*	Native	9.0	2	5, 4	28.0	Poor	Fair	no original tag	38.753510834	-121.269687885
2922	Interior Live Oak	*Quercus wislizeni*	Native	9.0	1		18.0	Fair	Fair	no original tag	38.753029998	-121.269993562
616	Interior Live Oak	*Quercus wislizeni*	Native	9.0	3	3,3,3	12.0	Poor	Fair	tag present from another survey	38.753813029	-121.270572065
100	Interior Live Oak	*Quercus wislizeni*	Native	10.0	1		18.0	Fair	Fair	no original tag	38.753182261	-121.268658535
1147	Interior Live Oak	*Quercus wislizeni*	Native	10.0	1		18.0	Poor	Poor		38.753521415	-121.269647392
1184	Interior Live Oak	*Quercus wislizeni*	Native	10.0	1		21.0	Poor	Fair	no original tag	38.753312878	-121.269433208
2921	Interior Live Oak	*Quercus wislizeni*	Native	10.0	1		24.0	Fair	Fair	no original tag	38.753045325	-121.270025406
2914	Interior Live Oak	*Quercus wislizeni*	Native	11.0	2	7, 4	24.0	Poor	Fair	no original tag	38.753314750	-121.270459845
717	Interior Live Oak	*Quercus wislizeni*	Native	11.0	1		15.0	Fair	Fair	no original tag	38.753987125	-121.270420211
718	Interior Live Oak	*Quercus wislizeni*	Native	11.0	2	6, 5	21.0	Poor	Fair	no original tag	38.753928833	-121.270497424
1124	Interior Live Oak	*Quercus wislizeni*	Native	12.0	1		24.0	Fair	Fair		38.753385643	-121.270343309
2918	Interior Live Oak	*Quercus wislizeni*	Native	12.0	1		24.0	Fair	Fair	no original tag	38.752958403	-121.270187128
2923	Interior Live Oak	*Quercus wislizeni*	Native	12.0	1		24.0	Poor	Poor	no original tag	38.753102804	-121.269922597
714	Interior Live Oak	*Quercus wislizeni*	Native	13.0	1		33.0	Poor	Fair	no original tag	38.754080541	-121.270366091
94	Interior Live Oak	*Quercus wislizeni*	Native	13.0	1		27.0	Poor	Fair	no original tag	38.753042382	-121.269120394
1167	Interior Live Oak	*Quercus wislizeni*	Native	14.0	1		24.0	Poor	Fair		38.753390178	-121.270482975

Tag Number	Common Name	Scientific Name	Nativity	Aggregate DBH (inches)	Number of Stems	All Trunks DBH (inches)	Dripline Radius (feet)	Structure**	Condition**	Comment	Latitude N	Longitude W
1200	Interior Live Oak	*Quercus wislizeni*	Native	14.0	1		24.0	Fair	Fair	no original tag	38.753116904	-121.268490499
95	Interior Live Oak	*Quercus wislizeni*	Native	14.0	1		36.0	Fair	Fair	no original tag	38.753042003	-121.269192086
2917	Interior Live Oak	*Quercus wislizeni*	Native	16.0	2	10, 6	27.0	Fair	Fair	no original tag	38.752899416	-121.270169664
710	Interior Live Oak	*Quercus wislizeni*	Native	16.0	1		36.0	Fair	Fair	no original tag	38.754533541	-121.270263818
716	Interior Live Oak	*Quercus wislizeni*	Native	16.0	2	9, 7	24.0	Poor	Fair	no original tag	38.753963417	-121.270443480
1146	Interior Live Oak	*Quercus wislizeni*	Native	17.0	2	8, 9	27.0	Poor	Fair		38.753510885	-121.269640453
614	Interior Live Oak	*Quercus wislizeni*	Native	17.0	1		27.0	Poor	Fair	tag present from another survey	38.753918898	-121.270471015
88	Interior Live Oak	*Quercus wislizeni*	Native	18.0	1		42.0	Poor	Fair	no original tag	38.753292871	-121.269163288
2915	Interior Live Oak	*Quercus wislizeni*	Native	20.0	3	7, 8, 5	24.0	Poor	Fair	no original tag	38.753307870	-121.270500916
86	Interior Live Oak	*Quercus wislizeni*	Native	20.0	1		48.0	Poor	Fair	no original tag	38.753308019	-121.268929474
712	Interior Live Oak	*Quercus wislizeni*	Native	31.0	2	13, 18	30.0	Fair	Good	no original tag	38.754269550	-121.270298028
1141, 1142	Interior Live Oak	*Quercus wislizeni*	Native	77.0	4	30, 16, 12, 19	54.0	Fair	Fair	originally mapped as 2 trees, really 1 tree	38.753383982	-121.269676895
2906	Oregon Ash	*Fraxinus latifolia*	Native	6.0	1		24.0	Poor	Fair	no original tag	38.753316001	-121.269952818
2926	Oregon Ash	*Fraxinus latifolia*	Native	6.0	1		39.0	Poor	Fair	no original tag	38.753249241	-121.270041898
1132	Oregon Ash	*Fraxinus latifolia*	Native	7.0	1		27.0	Poor	Fair		38.753389120	-121.270014609
1133	Oregon Ash	*Fraxinus latifolia*	Native	7.0	1		24.0	Poor	Fair		38.753387506	-121.270052901
2929	Oregon Ash	*Fraxinus latifolia*	Native	7.0	1		21.0	Fair	Fair	no original tag	38.753192571	-121.269951449
1122	Oregon Ash	*Fraxinus latifolia*	Native	8.0	1		36.0	Poor	Fair		38.753264442	-121.270037855
2909	Oregon Ash	*Fraxinus latifolia*	Native	8.0	2	4, 4	21.0	Poor	Fair	no original tag	38.753416015	-121.270244944
720	Oregon Ash	*Fraxinus latifolia*	Native	8.0	2	4, 4	18.0	Poor	Poor	no original tag	38.753677298	-121.270587698
1121	Oregon Ash	*Fraxinus latifolia*	Native	9.0	1		27.0	Fair	Fair		38.753277757	-121.270004923
2928	Oregon Ash	*Fraxinus latifolia*	Native	9.0	1		18.0	Fair	Fair	no original tag	38.753218075	-121.269984394
1152	Oregon Ash	*Fraxinus latifolia*	Native	10.0	1		21.0	Fair	Fair		38.753501272	-121.269807825
1164	Oregon Ash	*Fraxinus latifolia*	Native	10.0	1		18.0	Fair	Poor		38.753818473	-121.270476136
2908	Oregon Ash	*Fraxinus latifolia*	Native	10.0	2	5, 5	18.0	Fair	Fair	no original tag	38.753448331	-121.270077664
2924	Oregon Ash	*Fraxinus latifolia*	Native	10.0	1		36.0	Poor	Fair	no original tag	38.753158716	-121.270084641
2901	Oregon Ash	*Fraxinus latifolia*	Native	11.0	1		27.0	Fair	Poor	no original tag	38.753597410	-121.269669564
1120	Oregon Ash	*Fraxinus latifolia*	Native	12.0	1		30.0	Fair	Fair		38.753252827	-121.270000543
2927	Oregon Ash	*Fraxinus latifolia*	Native	12.0	1		33.0	Poor	Fair	no original tag	38.753205647	-121.270058513
704	Oregon Ash	*Fraxinus latifolia*	Native	12.0	2	7, 5	18.0	Poor	Fair	no original tag	38.753672229	-121.270365904
1168	Oregon Ash	*Fraxinus latifolia*	Native	15.0	1		24.0	Poor	Poor		38.753469027	-121.270528685
1134	Oregon Ash	*Fraxinus latifolia*	Native	17.0	2	7, 7	18.0	Fair	Fair		38.753492959	-121.270088750
706	Oregon Ash	*Fraxinus latifolia*	Native	24.0	4	6, 5, 6, 7	18.0	Fair	Fair	no original tag	38.753556400	-121.270136240
1136	Pecan	*Carya illinoinensis*	Non-native	7.0	1		18.0	Fair	Good		38.753438139	-121.269949601
2920	Pecan	*Carya illinoinensis*	Non-native	10.0	1		18.0	Good	Good	no original tag	38.752937965	-121.270126689
1159	Pecan	*Carya illinoinensis*	Non-native	18.0	1		18.0	Fair	Good		38.753752363	-121.270520717
1156	Red Alder	*Alnus rubra*	Native	11.0	1		18.0	Good	Good		38.753693869	-121.270517722
1157	Red Alder	*Alnus rubra*	Native	12.0	1		21.0	Good	Fair		38.753743544	-121.270485431
1162	Red Alder	*Alnus rubra*	Native	13.0	1		21.0	Fair	Good		38.753809877	-121.270422823
1163	Red Alder	*Alnus rubra*	Native	14.0	1		15.0	Poor	DEAD		38.753844142	-121.270479079
703	Red Alder	*Alnus rubra*	Native	15.0	2	7, 8	18.0	Poor	Fair	no original tag	38.753609179	-121.270381469
1160	Red Alder	*Alnus rubra*	Native	17.0	2	9, 8	27.0	Poor	Fair		38.753813678	-121.270455481
1161	Red Alder	*Alnus rubra*	Native	17.0	3	5, 6, 6	24.0	Poor	Poor		38.753794726	-121.270434468
1158	Red Alder	*Alnus rubra*	Native	18.0	3	6, 6, 6	15.0	Poor	Fair		38.753746929	-121.270515351
1183	Red Oak	*Quercus rubra*	Non-native	11.0	1		27.0	Fair	Good	no original tag	38.753270560	-121.269462500
1186	Scarlet Oak	*Quercus coccinea*	Non-native	11.0	1		21.0	Poor	Fair	no original tag, ganoderma root rot	38.753413994	-121.269484529
90	Scarlet Oak	*Quercus coccinea*	Non-native	11.0	1		21.0	Fair	Fair	no original tag	38.753332840	-121.269244408
1187	Scarlet Oak	*Quercus coccinea*	Non-native	12.0	1		27.0	Poor	Fair	no original tag	38.753407239	-121.269378860
91	Scarlet Oak	*Quercus coccinea*	Non-native	13.0	1		30.0	Poor	Fair	no original tag	38.753300769	-121.269269137
92	Scarlet Oak	*Quercus coccinea*	Non-native	14.0	1		33.0	Poor	Fair	no original tag	38.753259378	-121.269268669
93	Scarlet Oak	*Quercus coccinea*	Non-native	15.0	1		33.0	Poor	Fair	no original tag	38.753224831	-121.269237224

Tag Number	Common Name	Scientific Name	Nativity	Aggregate DBH (inches)	Number of Stems	All Trunks DBH (inches)	Dripline Radius (feet)	Structure**	Condition**	Comment	Latitude N	Longitude W
1188	Scarlet Oak	*Quercus coccinea*	Non-native	16.0	1		33.0	Fair	Fair	no original tag	38.753291481	-121.268269850
1180	Scarlet Oak	*Quercus coccinea*	Non-native	18.0	1		39.0	Fair	Fair	no original tag	38.753095425	-121.269638697
1198	Tulip Tree	*Lirodendron tulipifera*	Non-native	12.0	1		18.0	Good	Fair	no original tag	38.753136202	-121.268300265
2925	Valley Oak	*Quercus lobata*	Native	8.0	1		30.0	Poor	Fair	no original tag	38.753245741	-121.270127771
705	Valley Oak	*Quercus lobata*	Native	9.0	1		18.0	Fair	Fair	1135, tag gone	38.753534302	-121.270298187
1127	Valley Oak	*Quercus lobata*	Native	10.0	1		24.0	Fair	Fair		38.753414146	-121.270227032
2911	Valley Oak	*Quercus lobata*	Native	13.0	2	8, 5	21.0	Poor	Poor	no original tag	38.753263578	-121.270288170
1166	Valley Oak	*Quercus lobata*	Native	15.0	1		21.0	Fair	Poor	beaver damage	38.753490965	-121.270433510
1868	Valley Oak	*Quercus lobata*	Native	15.5	1		14.0	Good	Good	no original tag	38.753313713	-121.269571921
1185	Valley Oak	*Quercus lobata*	Native	19.0	1		33.0	Fair	Fair	no original tag	38.753339913	-121.269507571
1123	Valley Oak	*Quercus lobata*	Native	21.0	2	14, 7	24.0	Fair	Fair		38.753249005	-121.270134928
1192	Western Redbud	*Cercis occidentalis*	Native	8.0	1		12.0	Fair	Fair	no original tag	38.753301510	-121.268011114
1182	White Mulberry	*Morus alba*	Non-native	8.0	1		24.0	Fair	Good	no original tag	38.753153618	-121.269382984
1137	Willow	*Salix* sp.	Native	7.0	1		21.0	Fair	Fair		38.753410750	-121.269943591
2907	Willow	*Salix* sp.	Native	7.0	1		24.0	Poor	Poor	no original tag	38.753371430	-121.270014279
701	Willow	*Salix* sp.	Native	7.0	1		27.0	Poor	Poor	no original tag	38.753605015	-121.270023254
1129	Willow	*Salix* sp.	Native	8.0	1		18.0	Poor	Poor		38.753369123	-121.269977687
715	Willow	*Salix* sp.	Native	8.0	1		12.0	Poor	Poor	no original tag	38.753967105	-121.270464816
1130	Willow	*Salix* sp.	Native	9.0	1		24.0	Poor	Poor		38.753374193	-121.269966449
1139	Willow	*Salix* sp.	Native	9.0	1		18.0	Fair	Fair		38.753414544	-121.269887004
1118	Willow	*Salix* sp.	Native	10.0	1		21.0	Poor	Poor		38.753215081	-121.269864473
1138	Willow	*Salix* sp.	Native	10.0	1		21.0	Fair	Fair		38.753418332	-121.269901222
1148	Willow	*Salix* sp.	Native	10.0	1		42.0	Poor	Poor		38.753463489	-121.269875679
1150	Willow	*Salix* sp.	Native	10.0	1		33.0	Poor	Fair		38.753552702	-121.269871483
702	Willow	*Salix* sp.	Native	10.0	2	5, 5	18.0	Fair	Fair	no original tag	38.753642888	-121.270098858
1149	Willow	*Salix* sp.	Native	12.0	1		42.0	Poor	Poor		38.753523788	-121.269866852
713	Willow	*Salix* sp.	Native	15.0	1		42.0	Poor	Fair	no original tag	38.754151254	-121.270335202
1179	Willow	*Salix* sp.	Native	16.0	1		48.0	Poor	Fair	no original tag	38.753212849	-121.269856100
1119	Willow	*Salix* sp.	Native	17.0	1		15.0	Poor	Poor	no original tag	38.753197679	-121.269889710
1151	Willow	*Salix* sp.	Native	18.0	1		33.0	Poor	Poor		38.753516875	-121.269772901
1126	Willow	*Salix* sp.	Native	19.0	1		21.0	Poor	Poor		38.753447874	-121.270273793
1128	Willow	*Salix* sp.	Native	19.0	1		30.0	Fair	Poor		38.753299294	-121.269894733
2912	Willow	*Salix* sp.	Native	21.0	1		0.0	Poor	DEAD	no original tag	38.753237991	-121.270322019
1131	Willow	*Salix* sp.	Native	22.0	2	10, 12	24.0	Poor	Poor		38.753424931	-121.269994860
2913	Willow	*Salix* sp.	Native	37.0	1		27.0	Poor	DEAD	no original tag	38.753292803	-121.270411235
707	Willow	*Salix* sp.	Native	7.0	1		18.0	Poor	Poor	no original tag	38.753527603	-121.270073346

*Trunk of tree was on private property; tree was not tagged

**Please note, the survey results are intended for general project planning purposes and should not be considered a detailed tree analysis (e.g., results do not include hazard assessment, tree health diagnosis, preservation/removal recommendations, or pruning advisement).

ATTACHMENT C

Shadowbrook Tree Location Overview & Map

Shadowbrook
Tree Location Overview

Map Features

- ▭ Project Boundary
- 🟥 Map Book Grid

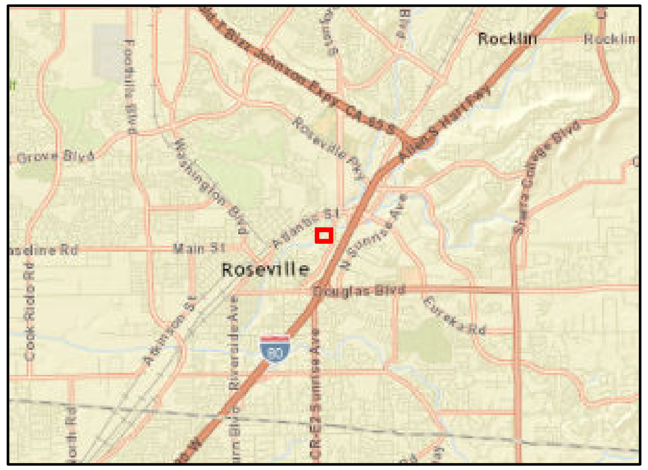
Native Species

- ◆ Black Walnut (*Juglans californica*)
- ◆ Blue Oak (*Quercus douglasii*)
- ◆ Fremont's Cottonwood (*Populus fremontii*)
- ◆ Interior Live Oak (*Quercus wislizeni*)
- ◆ Oregon Ash (*Fraxinus latifolia*)
- ◆ Red Alder (*Alnus rubra*)
- ◆ Valley Oak (*Quercus lobata*)
- ◆ Western Redbud (*Cercis occidentalis*)
- ◆ Willow (*Salix sp.*)

Non-Native Species

- ● Aleppo Pine (*Pinus halepensis*)
- ● Chinese Hackberry (*Celtis sinensis*)
- ● Chinese Privet (*Ligustrum sinense*)
- ● Crapemrytle (*Lagerstroemia indica*)
- ● Pecan (*Carya illinoinensis*)
- ● Red Oak (*Quercus rubra*)
- ● Scarlet Oak (*Quercus coccinea*)
- ● Tulip Tree (*Lirodendron tulipifera*)
- ● White Mulberry (*Morus alba*)

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Vegetation\v1\Shadowbrook_Tree_Location_Overview_v2.mxd (EL/JDS)-lhayden 2/22/2016

2015-020 Shadowbrook Lift Station and Force Main Project

Scale in Feet
0 100

Photo Source: USGS 2013

Map Date: 2/22/2016

Shadowbrook
Tree Location Map (Sheet 1 of 5)

Map Features

- Project Boundary
- Drip Line

Native Species

- 🟩 Black Walnut (*Juglans californica*)
- ◇ Blue Oak (*Quercus douglasii*)
- ◆ Interior Live Oak (*Quercus wislizeni*)

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Vegetation\Vegetation\v1\Shadowbrook_Tree_Location_Map_Book_V02.mxd *(EI/JDS)-lhayden 2/22/2016*

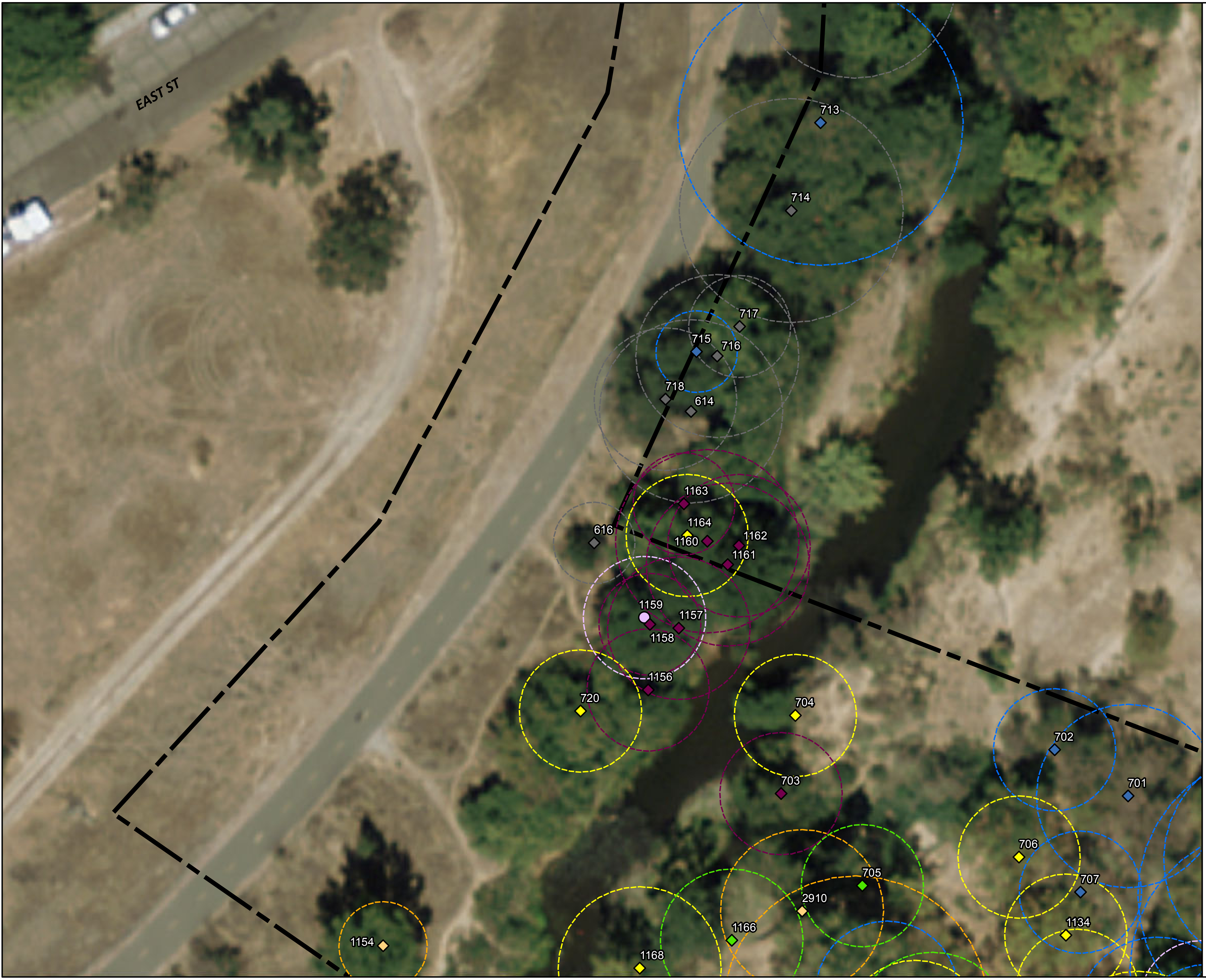
2015-020 Shadowbrook Lift Station and Force Main Project

Scale in Feet
0 30

Photo Source: USGS 2013

Map Date: 2/22/2016

Shadowbrook
Tree Location Map (Sheet 2 of 5)



Map Features

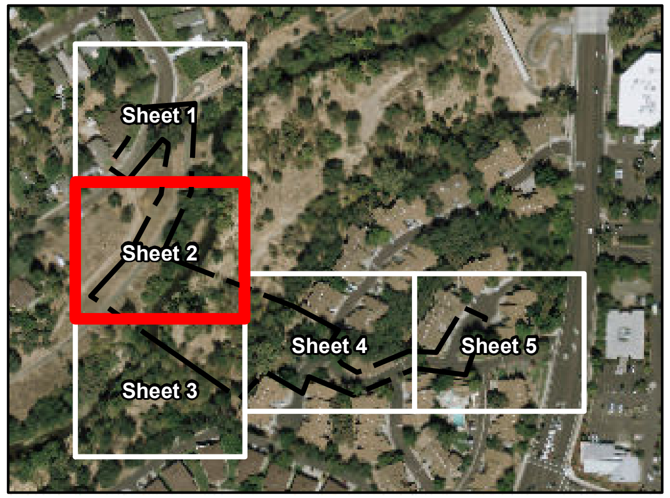
- Project Boundary
- Drip Line

Native Species

- ◆ Fremont's Cottonwood (*Populus fremontii*)
- ◆ Interior Live Oak (*Quercus wislizeni*)
- ◆ Oregon Ash (*Fraxinus latifolia*)
- ◆ Red Alder (*Alnus rubra*)
- ◆ Valley Oak (*Quercus lobata*)
- ◆ Willow (*Salix sp.*)

Non-Native Species

- ○ Pecan (*Carya illinoinensis*)



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2015-020 Shadowbrook Lift Station and Force Main Project

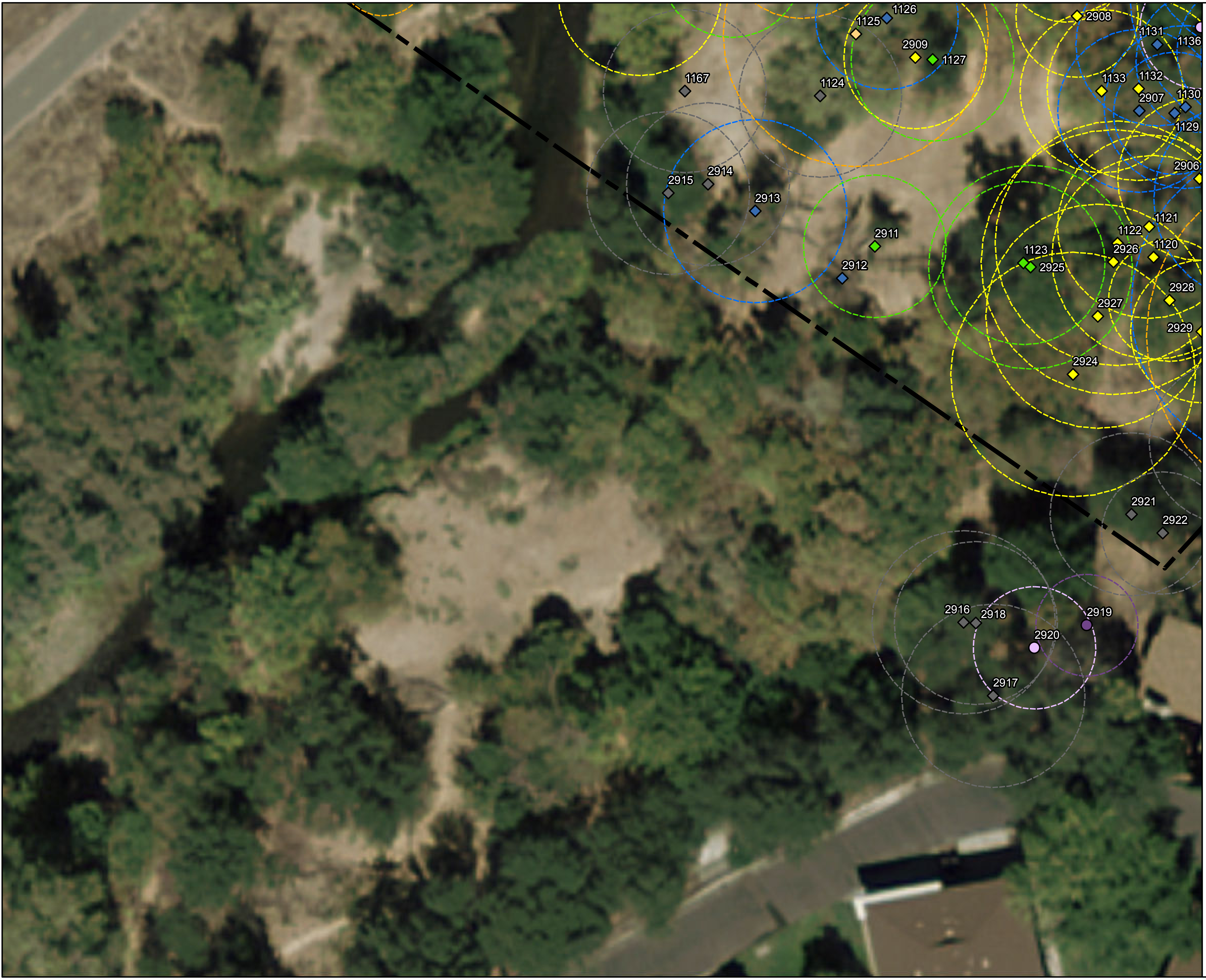
Scale in Feet
0 30

Photo Source: USGS 2013

Map Date: 2/22/2016

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Vegetation\Vegetation\v1\Shadowbrook_Tree_Location_Map_Book_V02.mxd (EI/JDS)-lhayden 2/22/2016

Shadowbrook
Tree Location Map (Sheet 3 of 5)



Map Features

Project Boundary

Drip Line

Native Species

◆ Fremont's Cottonwood (*Populus fremontii*)

◆ Interior Live Oak (*Quercus wislizeni*)

◆ Oregon Ash (*Fraxinus latifolia*)

◆ Valley Oak (*Quercus lobata*)

◆ Willow (*Salix sp.*)

Non-Native Species

● Chinese Privet (*Ligustrum sinense*)

● Pecan (*Carya illinoinensis*)

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Vegetation\Vegetation\v1\Shadowbrook_Tree_Location_Map_Book_V02.mxd *(El/JDS)-lhayden 2/22/2016*

2015-020 Shadowbrook Lift Station and Force Main Project

Scale in Feet
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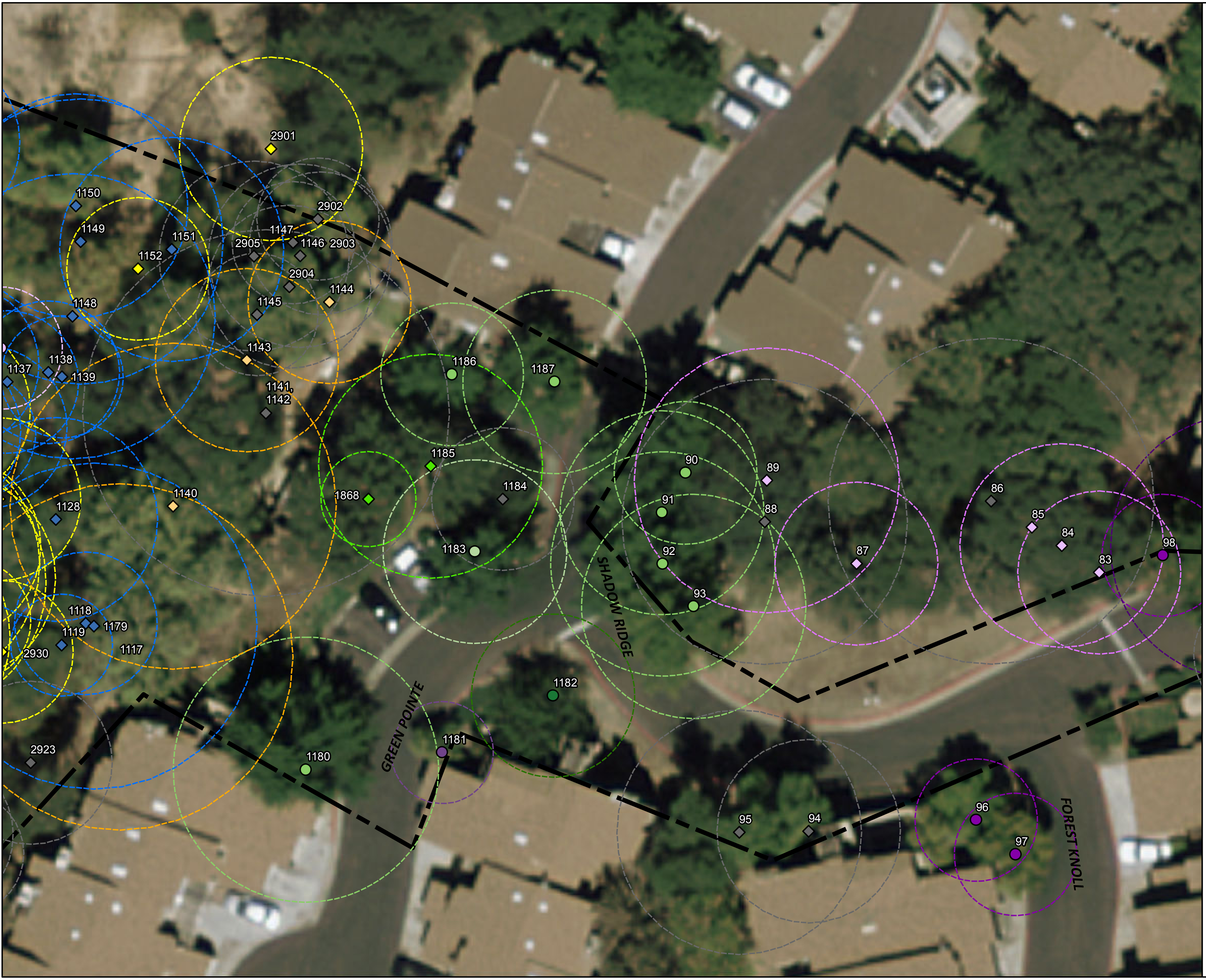
Photo Source: USGS 2013

Map Date: 2/22/2016

Shadowbrook
Tree Location Map (Sheet 4 of 5)



Map Features

▬ Project Boundary

◌ Drip Line

Native Species

◆ Blue Oak (*Quercus douglasii*)

◆ Fremont's Cottonwood (*Populus fremontii*)

◆ Interior Live Oak (*Quercus wislizeni*)

◆ Oregon Ash (*Fraxinus latifolia*)

◆ Valley Oak (*Quercus lobata*)

◆ Willow (*Salix sp.*)

Non-Native Species

● Chinese Hackberry (*Celtis sinensis*)

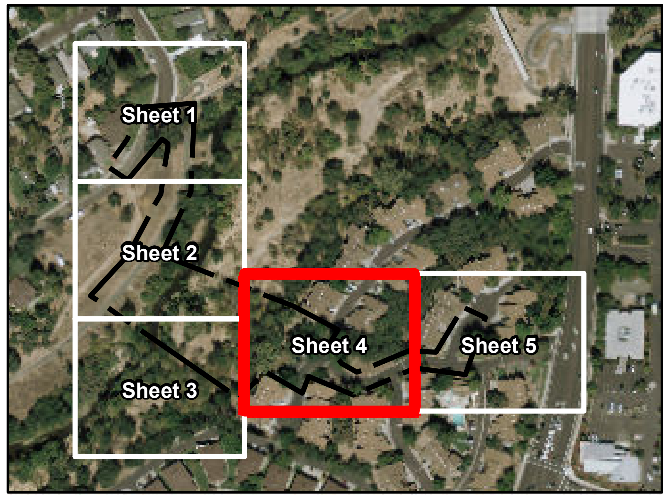
● Chinese Privet (*Ligustrum sinense*)

● Pecan (*Carya illinoinensis*)

● Red Oak (*Quercus rubra*)

● Scarlet Oak (*Quercus coccinea*)

● White Mulberry (*Morus alba*)



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Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Vegetation\Vegetation\v1\Shadowbrook_Tree_Location_Map_Book_V02.mxd *(El/JDS)-lhayden 2/22/2016*

2015-020 Shadowbrook Lift Station and Force Main Project

Scale in Feet
0 30

Photo Source: USGS 2013

Map Date: 2/22/2016

Shadowbrook
Tree Location Map (Sheet 5 of 5)

Map Features

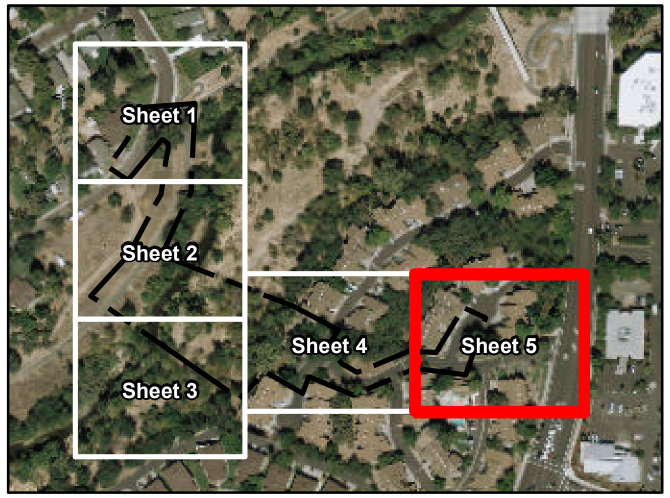
- ▬ Project Boundary
- ◌ Drip Line

Native Species

- ◆ Interior Live Oak (*Quercus wislizeni*)
- ◆ Western Redbud (*Cercis occidentalis*)

Non-Native Species

- ● Aleppo Pine (*Pinus halepensis*)
- ● Chinese Hackberry (*Celtis sinensis*)
- ● Crapemrytle (*Lagerstroemia indica*)
- ● Scarlet Oak (*Quercus coccinea*)
- ● Tulip Tree (*Lirodendron tulipifera*)



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Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Vegetation\Vegetation\v1\Shadowbrook_Tree_Location_Map_Book_V02.mxd (EI/JDS)-lhayden 2/22/2016

2015-020 Shadowbrook Lift Station and Force Main Project

Scale in Feet
0 30

N

Photo Source: USGS 2013

Map Date: 2/22/2016

APPENDIX C

Cultural Resources Inventory

REDACTED VERSION

Cultural Resources Inventory and Evaluation for the Shadowbrook Lift Station and Force Main Project

City of Roseville, Placer County, California

Prepared For:

Hatch Mott MacDonald
2495 Natomas Park Drive, Suite 530
Sacramento, California

Prepared By:

Stephen Pappas
ECORP Consulting, Inc.
2525 Warren Drive
Rocklin, California 95677

Under the direction of Principal Investigator:

Lisa Westwood, RPA

20 November 2015

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

MANAGEMENT SUMMARY

In 2015, ECORP Consulting, Inc. was retained to conduct a cultural resources inventory for the proposed Shadowbrook Lift Station and Force Main project. The City of Roseville proposes to improve emergency effluent storage capabilities through modifications to the existing Shadowbrook Lift Station located in the City of Roseville, Placer County, California.

The cultural resources inventory included a records search, literature review, and pedestrian field survey of the Project Area. The records search results indicated that [redacted] previous cultural resources studies have been conducted within 0.25 mile of the Project Area. As a result of those previous studies, [redacted] have previously been recorded within 0.25 mile of the Project Area but no sites were previously recorded within the Project Area.

As a result of the pedestrian field survey, one isolated [redacted]. This [redacted] was evaluated using the National Register of Historic Places and California Register of Historical Resources eligibility criteria and was found to be not eligible, pending agency concurrence. Recommendations for the management of unanticipated discoveries are also provided.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ATTACHMENTS

1.0 INTRODUCTION

In July 2015, ECORP was retained to conduct a cultural resources inventory for the proposed Project located in the City of Roseville, Placer County, California. A survey of the project area was required to identify potentially eligible cultural resources (archaeological sites and historic buildings, structures, and objects) that could be affected by the proposed Project.

1.1 Project Location

The Project Area consists of approximately 4.47 acres of property located in the [redacted]

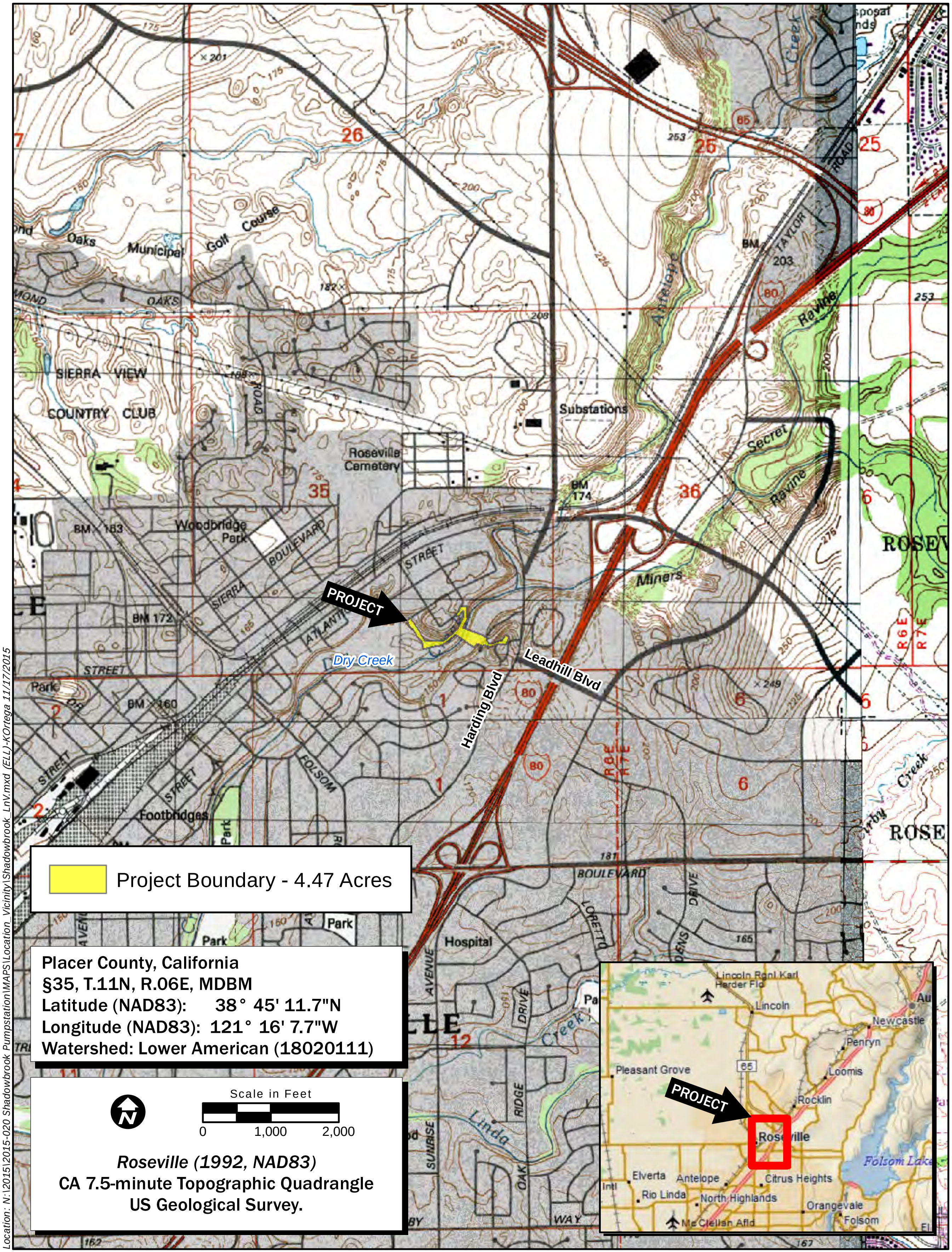
1.2 Project Description

The proposed Project entails the construction of upgrades to the existing Shadowbrook Lift Station and Force Main facilities. This will involve removal and replacement of the existing underground storage tank and related appurtenances including partial reconfiguration and reconstruction of the existing lift station block wall. The reconstructed lift station will have a footprint approximately 4,000 square feet larger than the existing facility. The expansion area is immediately adjacent to the existing facility and currently is occupied by a concrete pad. The project also includes installation of dual 6-inch force mains that would connect the existing wet well on the [redacted] with the existing 63-inch sewer located on the western side of the creek. The force main installation would utilize jack and bore and/or trenching construction techniques.

1.3 Area of Potential Effects

The Area of Potential Effects (APE) consists of the horizontal and vertical characteristics of the project, which could cause a significant impact or adverse effect to Historical Resources or Historic Properties.

The horizontal APE consists of all areas where activities associated with the project are proposed, and in the case of the current project, equals the Project Area subject to environmental review under the California Environmental Quality Act (CEQA) and Section 106. This includes areas proposed for construction, vegetation removal, grading, jack and bore digging and trenching, concrete foundation removal, stockpiling, staging, paving, and other elements described in the official project description. The horizontal APE is illustrated in Figure 1, and also represents the survey coverage area shown in Figure 2. The total area of the horizontal APE measures approximately [redacted] acres.



Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Location_Vicinity\Shadowbrook_LnV.mxd (ELL)-KOrtega 11/17/2015

Map Date: 11/17/2015
Service Layer Credits: Copyright:© 2013 DeLorme

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Figure 1. Project Location and Vicinity

2015-020 Shadowbrook Pumpstation

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Cultural_Resources\Survey_Coverage\Shadowbrook_SurveyCoverage_v2.mxd (ELL)-KOrtega 11/19/2015

Placer County, California
§35, T.11N, R.06E, MDBM
Watershed: Lower American (18020111)

Roseville (1992, NAD 83)
CA 7.5-minute Topographic Quadrangle
US Geological Survey

Map Date: 11/19/2015
Service Layer Credits: Copyright:© 2013 DeLorme
Copyright: © 2013 National Geographic Society

Figure 2. Survey Coverage

2015-020 Shadowbrook Pumpstation

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The vertical APE is described as the maximum depth below the surface to which excavations for boring and trenching activities, as well as construction of foundations for facilities, will extend. Therefore, the vertical APE includes all subsurface areas where archaeological deposits could be affected. The subsurface vertical APE varies across the project and may extend up to 12 feet below the surface for installation of the force main.

The vertical APE also is described as the maximum height of structures, which could impact the physical integrity and integrity of setting of cultural resources, including districts and traditional cultural properties. For the current project, the above-surface vertical APE could be up to 8 feet for the installation of lift station block wall.

1.4 Regulatory Context

To meet the regulatory requirements of this project, this cultural resources investigation was conducted pursuant to the provisions for the treatment of cultural resources contained within Section 106 of the National Historic Preservation Act (NHPA) and in CEQA; (Pub. Res. Code §21000 et seq.) The goal of NHPA and CEQA is to develop and maintain a high-quality environment that serves to identify the significant environmental effects of the actions of a proposed project and to either avoid or mitigate those significant effects where feasible. CEQA pertains to all proposed projects that require state or local government agency approval, including the enactment of zoning ordinances, the issuance of conditional use permits, and the approval of development project maps. NHPA pertains to projects that entail some degree of federal funding or permit approval.

NHPA and CEQA (Title 14, CCR, Article 5, §15064.5) apply to cultural resources of the historical and prehistoric periods. Any project with an effect that may cause a substantial adverse change in the significance of a cultural resource, either directly or indirectly is a project that may have a significant effect on the environment. As a result, such a project would require avoidance or mitigation of impacts to those affected resources. Significant cultural resources must meet at least one of four criteria that define eligibility for listing on either the California Register of Historical Resources (CRHR) (Pub. Res. Code §5024.1, Title 14 CCR, §4852) or the National Register of Historic Places (NRHP) (36 CFR 60.4). Cultural resources eligible for listing on the NRHP are considered Historic Properties under 36 CFR Part 800 and are automatically eligible for the CRHR. Resources listed on or eligible for inclusion in the CRHR are considered Historical Resources under CEQA.

In anticipation of the possibility that the project may affect Waters of the United States (U.S.), thereby requiring the project proponent to meet the requirements of Section 404 of the Clean Water Act and obtain a permit from the U.S. Army Corps of Engineers' (USACE's) Sacramento District Regulatory Branch, this report is also in compliance with the 2014 *Sacramento District Regulatory Branch Guidelines for Compliance with Section 106 of the National Historic Preservation Act of 1966, as amended*. Moreover, because this project may qualify as a federal undertaking, regulations (36 CFR Part 800) implementing Section 106 of the NHPA require that cultural resources be identified and then evaluated using NRHP eligibility criteria.

1.5 Report Organization

The following report documents the study and its findings and was prepared in conformance with the California Office of Historic Preservation's (OHP's) *Archaeological Resource Management Reports: Recommended Contents and Format.* Attachment A includes a confirmation of the records search with the California Historical Resources Information System (CHRIS) and a letter sent to the Placer County Historical Society. Attachment B contains documentation of Native American Coordination. Attachment C presents photographs of the Project Area, and Attachment D contains confidential cultural resource site locations and site records.

Sections 6253, 6254, and 6254.10 of the California Code authorize state agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code §6250 et seq.) and California's open meeting laws (The Brown Act, Government Code §54950 et seq.) protect the confidentiality of Native American cultural place information. Under Exemption 3 of the federal Freedom of Information Act (5 USC 5), because the disclosure of cultural resources location information is prohibited by the Archaeological Resources Protection Act of 1979 (16 USC 470hh) and Section 304 of the NHPA, it is also exempted from disclosure under the Freedom of Information Act. Likewise, the Information Centers of the California Historical Resources Information System maintained by the OHP prohibit public dissemination of records search information. In compliance with these requirements, the results of this cultural resource investigation were prepared as a confidential document, which is not intended for public distribution in either paper or electronic format.

2.0 SETTING

2.1 Environmental Setting

Elevations within the Project Area range from 145 to 175 feet above mean sea level, which accounts for the slopes dropping into [redacted] center of the Project Area. [redacted]

2.2 Geology and Soils

Three soil types are located within the Project Area as identified by the United States Department of Agriculture's (USDA), Natural Resources Conservation Service web soil survey website (USDA 2015). These soils consist of Cometa-Ramona sandy loams (142), Ramona sandy loam (175), and Xerofluvents (194). The majority of the soil within the Project Area consists of the Cometa-Ramona sandy loam located along the banks and terraces of [redacted], which is a well-drained alluvium derived from granite and commonly found along terraces. The typical soil profile consists of sandy loam from surface to 18 inches below, clay between 18 to 29 inches, and sandy loam between 29 and 60 inches below the surface (USDA 2015).

Due to the presence of alluvium along [redacted], and given the likelihood of prehistoric archaeological sites located along perennial waterways, there exists the potential for buried prehistoric archaeological sites in the APE. As a result, a cultural resources inventory that included an archaeological survey of the APE was required.

2.3 Vegetation and Wildlife

The dominant plant community within the Project Area includes a riparian vegetation corridor along [redacted] consisting of valley oak (*Quercus lobata*), interior live oak (*Q. wizlizeni*), blue oak (*Q. douglasii*), Fremont's cottonwood (*Populus fremontii*), and several willows (especially *Salix lasiolepis* and *S. exigua*). A shrub layer consists of button-willow (*Cephalanthus occidentalis*), privet (*Ligustrum* sp.), catalpa (*Catalpa bignonioides*), California ash (*Fraxinus dipetala*), white alder (*Alnus rhombifolia*), and other native and naturalized species. Annual grasses (including *Bromus diandrus*, *Bromus hordeaceus*, *Avena fatua*, and *Phalaris arundinacea*) occur on the exposed banks, along with several introduced forbs including yellow star thistle (*Centaurea solstitialis*), tarweed (*Holocarpha virgata*), chicory (*Chicory chicorum*), and red-stemmed filaree (*Erodium botrys*). Other dominant understory species in places include Himalayan blackberry (*Rubus armeniacus*), fennel (*Foeniculum vulgare*), vetches (*Vicia* sp.), bedstraw (*Gallium* sp.), and periwinkle (*Vinca major*).

Wildlife species that may occur in the Project Area include western fence lizard (*Sceloporus occidentalis*), Southern alligator lizard (*Elgaria multicarinata*), gopher snake (*Pituophis catenifer*), California kingsnake (*Lampropeltis getula*), white-breasted nuthatch (*Sitta carolinensis*), western scrub jay (*Aphelocoma californica*), Nuttall's woodpecker (*Picoides nuttallii*), acorn woodpecker (*Melanerpes formicivorus*), and red-shouldered hawk (*Buteo lineatus*). Mammals found in the oak woodlands include opossum (*Didelphis virginiana*), brush mouse (*Peromyscus boylii*), western gray squirrel (*Sciurus griseus*), eastern fox squirrel (*Sciurus niger*), and coyote (*Canis latrans*).

The creek corridor itself provides habitat for numerous aquatic or amphibious animals, including providing migration, spawning, and rearing habitat for federally threatened Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*). Other aquatic species observed or known within the [redacted] corridor include red swamp crayfish (*Procambarus clarkii*), bluegill (*Lepomis macrochirus*), American bullfrog (*Lithobates catesbeianus*), Sierra chorus frog (*Pseudacris sierra*), Western toad (*Anaxyrus boreas*), muskrat (*Ondatra zibethicus*), Western pond turtle (*Actinemys marmorata*), North American beaver (*Castor canadensis*), and river otter (*Lontra canadensis*). Numerous bird species use the waters for foraging, including mallard (*Anas platyrhynchos*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), and black phoebe (*Sayornis nigricans*).

3.0 CULTURAL CONTEXT

3.1 Regional Prehistory

It is generally believed that human occupation of California began at least 10,000 years before present (BP). The archaeological record indicates that between approximately 10,000 and 8,000 BP, a predominantly hunting economy existed, characterized by archaeological sites containing numerous projectile points and butchered large animal bones. Animals that were hunted probably consisted mostly of large species that still exist today. Bones of extinct species have been found, but cannot definitely be associated with human artifacts. Although small animal bones and plant grinding tools are rarely found within archaeological sites of this period, small game and floral foods were probably exploited on a limited basis. A lack of deep cultural deposits from this period suggests that groups included only small numbers of individuals who did not often stay in one place for extended periods (Wallace 1978).

Around 8,000 BP, there was a shift in focus from hunting towards a greater reliance on plant resources. Archaeological evidence of this trend consists of a much greater number of milling tools (e.g., metates and manos) for processing seeds and other vegetable matter. This period, which extended until around 5,000 years BP, is sometimes referred to as the Millingstone Horizon (Wallace 1978). Projectile points are found in archaeological sites from this period, but they are far fewer in number than from sites dating to before 8,000 BP. An increase in the size of groups and the stability of settlements is indicated by deep, extensive middens at some sites from this period (Wallace 1978).

In sites dating to after about 5000 BP, archaeological evidence indicates that reliance on both plant gathering and hunting continued as in the previous period, with more specialized adaptation to particular environments. Mortars and pestles were added to metates and manos for grinding seeds and other vegetable material. Flaked-stone tools became more refined and specialized, and bone tools were more common. During this period, new peoples from the Great Basin began entering southern California. These immigrants, who spoke a language of the Uto-Aztecan linguistic stock, seem to have displaced or absorbed the earlier population of Hokan-speaking peoples. During this period, known as the Late Horizon, population densities were higher than before and settlement became concentrated in villages and communities along the coast and interior valleys (Erlandson 1994; McCawley 1996). Regional subcultures also started to develop, each with its own geographical territory and language or dialect (Kroeber 1976; McCawley 1996; Moratto 1984). These were most likely the basis for the groups encountered by the first Europeans during the eighteenth century (Wallace 1978). Despite the regional differences, many material culture traits were shared among groups, indicating a great deal of interaction (Erlandson 1994). The introduction of the bow and arrow into the region sometime around 2000 BP is indicated by the presence of small projectile points (Wallace 1978; Moratto 1984).

3.2 Local Prehistory

The earliest evidence of the prehistoric inhabitants of the region surrounding the Project Area comes from a single, deeply buried site in the bank of Arcade Creek, north of Sacramento, containing grinding tools and large, stemmed projectile points. The points and grinding implements suggest an occupation date of sometime between 8,000 and 5,000 BP (Wallace 1978). However, it was not until after about 5,500 BP, in the Late Archaic Period, when people began to move into the San Joaquin and Sacramento Valleys in any significant numbers. This earliest permanent settlement of the Delta region of the Sacramento River is called the Windmiller Tradition and is known primarily from burial sites containing relatively elaborate grave goods (Ragir 1972; Wallace 1978). The Windmiller Tradition reflects the amplification of cultural trends begun in the Middle Archaic, as seen in the proliferation of finished artifacts such as projectile points, shell beads and pendants, and highly polished charmstones. Stone mortars and pestles, milling stones, bone tools such as fishhooks, awls, and pins, are also present. It is probable that people during this time subsisted on deer and other game, salmon, and hard seeds. They also were apparently the first Californians to discover the process for leaching the tannins out of acorns, thus making them edible by humans. Based on linguistic evidence, it has been suggested that the Windmiller culture was ancestral to several historic tribes in the Central Valley, including the Penutian-speaking Nisenan (Elsasser 1978). The Windmiller Tradition lasted until about 3,000 BP.

Around 3000 BP, subsistence strategies in the Delta region became noticeably more “focal,” with a clear increase in the reliance on acorns and salmon (Elsasser 1978). Culturally, this has been dubbed the Cosumnes Tradition (3,700 to 1,000 BP), and appears to be an outgrowth of the Windmiller Tradition (Ragir 1972). People in this time continued to occupy knolls or similar high spots above the floodplain of the Sacramento River and the terraces of tributaries such as the Cosumnes and American Rivers, flowing out of the foothills of the Sierra Nevada Mountains located to the east. Populations increased and villages became more numerous than before, with more milling tools and specialized equipment for hunting and fishing. Trade appears to have increased, with burials containing larger amounts of seashell and obsidian. Burial styles, too, became more varied, with the addition of flexed interments along with the extended ones of the Windmiller period. Projectile points found embedded in the bones of excavated skeletons suggest that warfare was on the rise, possibly as a result of increased competition over available resources and trade (Beardsley 1954; Lillard et al. 1939; Ragir 1972).

The next, and final, discrete prehistoric culture is the Hotchkiss Tradition (1,000 to 181 BP [AD 1769]) that persisted until the arrival of European settlers in central California (Beardsley 1954; Ragir 1972). During this period, use of acorns and salmon reached its peak, along with hunting of deer. Diet was supplemented with the addition of waterfowl, hard seeds, and other resources. Large sedentary villages along the lower Sacramento and San Joaquin Rivers and their tributaries and delta were common. The size and density of these settlements suggest a further increase in population from Cosumnes times. Trade goods were plentiful and burials exhibit a marked stratification of society with wide differences in the amount and variety of funerary objects. Cremation of the dead appears, along with the flexed inhumations of the previous period (Ragir 1972). While ornamental or ritual artifacts, such as large, fragile projectile points and trimmed bird bone increase during this period, milling tools are rare or absent. Shell beads are found in large numbers, and there are numerous utilitarian artifacts of bones such as awls, needles, and barbed harpoon points. Polished charmstones are rare during this time, but ground stone pipes become more abundant. In addition, fired and unfired clay objects begin to appear.

3.3 Ethnography

Ethnographically, the Project Area is in the [redacted] portion of the territory occupied by the Penutian-speaking Nisenan. The territory extended from the area surrounding the current City of Oroville on the north to a few miles south of the American River in the south. The Sacramento River bounded the territory on the west, and in the east, it extended to a general area located within a few miles of Lake Tahoe. As a language, Nisenan (meaning “from among us” or “of our side”) has three main dialects – Northern Hill, Southern Hill, and Valley Nisenan, with three or four subdialects (Kroeber 1976; Placer County 1992; Shipley 1978; Wilson and Towne 1978). The Valley Nisenan lived along the Sacramento River, primarily in large villages with populations of several hundred each. Between there and the foothills, the grassy plains were largely unsettled, used mainly as a foraging ground by both valley and hill groups (Placer County 1992). Individual and extended families "owned" hunting and gathering grounds, and trespassing was discouraged (Kroeber 1976; Wilson and Towne 1978). Residence was generally patrilocal, but couples actually had a choice in the matter (Wilson and Towne 1978).

Politically, the Nisenan were divided into "tribelets," made up of a primary village and a series of outlying hamlets, presided over by a more-or-less hereditary chief (Kroeber 1976; Wilson and Towne 1978). Villages typically included family dwellings, acorn granaries, a sweathouse, and a dance house, owned by the chief. The chief had little authority to act on his or her own, but with the support of the shaman and the elders, the word of the chief became virtually the law (Wilson and Towne 1978).

Subsistence activities centered on the gathering of acorns (tan bark oak and black oak were preferred), seeds, and other plant resources. The hunting of animals such as deer and rabbits, and fishing were also an important part of normal subsistence activities. Large predators, such as mountain lions were hunted for their meat and skins, and bears were hunted ceremonially. Although acorns were the staple of the Nisenan diet, they also harvested roots like wild onion and "Indian potato," which were eaten raw, steamed, baked, or dried and processed into flour cakes to be stored for winter use (Wilson and Towne 1978). Wild garlic was used as soap/shampoo, and wild carrots were used medicinally (Littlejohn 1928). Seeds from grasses were parched, steam dried, or ground and made into a mush. Berries were collected, as were other native fruits and nuts. Game was prepared by roasting, baking, or drying. In addition, salt was obtained from a spring near modern-day Rocklin (Wilson and Towne 1978).

Hunting of deer often took the form of communal drives, involving several villages, with killing done by the best marksmen from each village. Snares, deadfalls, and decoys were used as well. Fish were caught by a variety of methods including use of hooks, harpoons, nets, weirs, traps, poisoning, and by hand (Wilson and Towne 1978).

Trade was important with goods traveling from the coast and valleys up into the Sierra Nevada Mountains and beyond to the east, and vice versa. Coastal items like shell beads, salmon, salt, and Foothill pine nuts were traded for resources from the mountains and farther inland, such as bows and arrows, deer skins, and sugar pine nuts. In addition, obsidian was imported from the north (Wilson and Towne 1978).

The Spanish arrived on the central California coast in 1769 and by 1776 the Miwok territory bordering the Nisenan on the south had been explored by José Canizares. Gabriel Moraga crossed Nisenan territory in 1808 and a major battle was fought between the Miwok and the Spaniards in 1813 near the mouth of the Cosumnes River. Though the Nisenan appear to have escaped being removed to missions by the Spanish, they were not spared the ravages of European diseases. In 1833, an epidemic – probably malaria – raged through the Sacramento Valley, killing an estimated

75 percent of the native population. When John Sutter erected his fort at the future site of Sacramento in 1839, he had no problem getting the few Nisenan survivors to settle nearby. The discovery of gold in 1848 at Sutter's Mill, near the Nisenan village of *Colluma* (now Coloma) on the South Fork of the American River, drew thousands of miners into the area, and led to widespread killing and the virtual destruction of traditional Nisenan culture. By the Great Depression, no Nisenan remained who could remember the days before the arrival of the Euro-Americans (Wilson and Towne 1978).

3.4 Regional History

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. Cabrillo was sent north by the Viceroy of New Spain (Mexico) to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English adventurer Francis Drake visited the Miwok Native American group at Drake's Bay or Bodega Bay in 1579. Sebastian Vizcaíno explored the coast as far north as Monterey in 1602. He reported that Monterey was an excellent location for a port (Castillo 1978).

Colonization of California began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay Area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and pueblos (towns) were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California) beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. No missions were established in the Central Valley. The nearest missions were in the vicinity of San Francisco Bay and included Mission San Francisco de Asis (Dolores) established in 1776 on the San Francisco peninsula, Mission Santa Clara de Asis at the south end of San Francisco Bay in 1777, Mission San Jose in 1797, Mission San Rafael, established as an *asistencia* in 1817 and a full mission in 1823, and Mission San Francisco Solano in Sonoma in 1823 (Castillo 1978; California Missions Online n.d.). Presidios were established at San Francisco and Monterey. The Spanish took little interest in the area and did not establish any missions or settlements in the Central Valley.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California with its capital at Monterey. In 1827, American trapper Jedediah Smith traveled along the Sacramento River and into the San Joaquin Valley to meet other trappers of his company who were camped there, but no permanent settlements were established by the fur trappers (Thompson and West 1880).

The Mexican government closed the missions in the 1830s and former mission lands, as well as previously unoccupied areas, were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or "ranchos" (Robinson 1948). During the Mexican period there were small towns at San Francisco (then known as Yerba Buena) and Monterey. The rancho owners lived in one of the towns or in an adobe house on the rancho. The Mexican Period includes the years 1821 to 1848.

John Sutter, a European immigrant, built a fort at the confluence of the Sacramento and American Rivers in 1839 and petitioned the Mexican governor of Alta California for a land grant, which he received in 1841. Sutter built a flour mill and grew wheat near the fort (Bidwell 1971). Gold was discovered in the flume of Sutter's lumber mill at Coloma on the South Fork of the American River in January 1848 (Marshall 1971). The discovery of gold initiated the 1849 California Gold Rush, which brought thousands of miners and settlers to the Sierra foothills east and southeast of Sacramento.

The American period began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. As a result of the treaty, Alta California became part of the United States as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by U.S. courts, but usually with more restricted boundaries, which were surveyed by the U.S. Surveyor General's office. Land outside the land grants became federal public land which was surveyed into sections, quarter-sections, and quarter-quarter sections. The federal public land could be purchased at a low fixed price per acre or could be obtained through homesteading (after 1862) (Robinson 1948).

3.5 Project Area History

The Project Area is in Placer County, which formed in 1851 from parts of Sutter and Yuba Counties. The principal economic activity in much of the county at that time was placer mining, hence the name. However, gold deposits were absent in the alluvial valley portion of western Placer County, and ranching (cattle and sheep) and agriculture (wheat cultivation) were the principal economic activities. The Project Area lies within the town of Roseville, and has been used primarily for agricultural production since it was first settled. The nearby town of Lincoln was surveyed and platted on the proposed line of the California Central Railroad (CCRR) from Folsom to Marysville, which passed through what would become Roseville. Folsom was already connected by rail to Sacramento via the Sacramento Valley Railroad. The CCRR was the first railroad to pass through southwestern Placer County and was completed from Folsom to Lincoln in 1861.

Roseville was originally named Junction because it was located where the CCRR crossed the proposed route of the Central Pacific Railroad, a segment of the First Transcontinental Railroad. The name Roseville was given to the Central Pacific Railroad station and was named for the most popular girl at a picnic (Gudde 1969) or was named for the nearby ranch of Rose Spring, owned by Judge James McGinley (Thompson & West 1882).

On 25 April 1864, the Central Pacific Railroad was completed from Sacramento to Roseville and soon trains were traveling to and from Sacramento on a daily basis (Department of Parks and Recreation 1979). Around this date, the first freight depot at Roseville Junction was built and operated by Cyrus Taylor (Davis 1964). The Central Pacific Railroad connected with the Union Pacific Railroad at Promontory Point, Utah, in 1869 to form the First Transcontinental Railroad. The Central Pacific Railroad later merged with the Southern Pacific Railroad and was known as the Southern Pacific Railroad after 1885 (Davis 1964). The town served as a stopping point for the transportation needs of the local farmers and ranchers. Between 1906 and 1909, Roseville became one of the fastest growing towns in the area when the Southern Pacific Railroad repair facilities and roundhouse, originally located in the neighboring city of Rocklin, were moved to Roseville. By the 1920s, Roseville had one of the largest freight yards west of the Mississippi River. During the early to mid-1900s, the town remained an important railroad depot; however, once Interstate 80 was completed, and other means of transportation became available, the depot was finally closed in 1972 (Davis 1993). Although Roseville was hit hard by the decline in railroad transportation, the town has proceeded to grow due to the introduction of many industrial headquarters and the central location of the city within the Sacramento Valley.

Roseville had its beginnings in the aftermath of the California Gold Rush when discouraged gold seekers left the mineral regions to take up farming along rich creek bottom lands. These pioneers formed the nucleus of what was to become the “first families” of Roseville. One of the first sections of southwestern Placer County to be settled was the rich lands of the Dry Creek District (City of Roseville 2015, Davis 1964).

Among the pioneer settlers of the Dry Creek District was Martin A. Schellhous who came to California with his wife and acquired a 240-acre ranch. Having brought a number of cattle with him from Michigan, Schellhous’ focus was on raising stock. Later diversifying and expanding his agricultural pursuits, he planted vineyards, orchards and fields of grain on his property (City of Roseville 2015).

Between 1870 and 1879, Roseville experienced slow but steady development. New construction already underway and reported in the *Placer Herald* of Jan. 1, 1870 included a new hotel, known as the Roseville Hotel, being erected by Daniel S. Neff, who had formerly operated the 17 Mile House on the old Auburn Road located in Sacramento County. The Roseville Hotel became one of the more prominent businesses in Roseville during the 1870s (Davis 1964). By 1890, though growth had not spiked, a movement toward a more industrial base had begun and business activity increased (City of Roseville 2015).

Fruit shipping became an important factor in the economy of Roseville at the beginning of the twentieth century. Figures compiled by the Roseville Board of Trade for 1901 revealed that during the year alone, more than 781,000 pounds of fresh deciduous fruits had been shipped from Roseville, along with 3,000 boxes of oranges, 22,380 pounds of pickled olives and 8,000 pounds of olive oil. Hand-in-hand with the increased activity of shipping fruit was a great upsurge in viticulture. Historic records indicate that a total of 1,195,436 boxes of grapes were shipped from the Roseville depot in 1901 (City of Roseville 2015, Davis 1964).

The new State Highway was routed through Roseville in 1912. Roads were paved commencing at the lower end of Riverside Avenue and connecting to the State Highway on the Lincoln Road. While Roseville was launching its new government and contributing its share to the war effort during World War I, the city continued to grow. In a two-and-a-half-year period (September 1911 – January 1914), more than 110 new buildings were erected. Population increased from 2,608 in 1910 to 4,477 in 1920. By 1924, the Southern Pacific Railroad purchased 200 acres of land between Roseville and Antelope for relocation of Pacific Fruit Express (PFE) shops and construction of 77 miles of new tracks to be used by both Southern Pacific and PFE. By June 1927, the new facilities were in operation (City of Roseville 2015).

The considerable building and commercial development which characterized Roseville throughout the 1920s was curbed drastically by the Great Depression. However, Municipal improvements continued to progress in spite of the Depression. Though Roseville had become a "city" in 1909, it was not until 1935 that voters, by a 443 to 194 count, permitted the community to become a "charter city" which gave residents the ability to change how their city is governed. Between 1941 and 1942, no major building activity was reported in the columns of *The Press Tribune*. By the latter date, however, approximately 1,000 new residents had moved into Roseville, most of who worked in nearby defense installations or for the railroad (City of Roseville 2015).

The population boom, which hit southern California with sudden swiftness in the late 1940s and spread quickly to northern California in the following decades, focused on southwestern Placer County after 1960. George Buljan served as mayor during this period of rapid growth and great change. Buljan served on the City Council for 24 years. The city, among other things, named a middle school after him, which is located off Washington Boulevard, just east of the Project Area. The population boom of the 1960s continued throughout the 1970s.

4.0 METHODS

4.1 Personnel Qualifications

All phases of the cultural resources investigation were conducted or supervised by Registered Professional Archaeologist Lisa Westwood, who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historical archaeologist. Fieldwork was conducted by Field Director Stephen Pappas. Lisa Westwood, RPA provided technical report review and quality assurance. Resumes are available upon request.

Lisa Westwood, the Principal Investigator, is a Registered Professional Archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historical archaeologist with over 20 years of experience. She holds a B.A. degree in Anthropology and an M.A. degree in Anthropology (Archaeology). She has participated in or supervised numerous survey, testing, and data recovery excavations, has recorded and mapped hundreds of prehistoric and historical sites, and has cataloged, identified, and curated hundreds of thousands of artifacts. She has conducted evaluations of cultural resources for eligibility to the NRHP and CRHR and is well versed in impact assessment and development of mitigation measures for CEQA and Section 106 (NHPA) projects.

Stephen Pappas is a Staff Archaeologist and Field Director for ECORP and has over ten years of experience in cultural resources management, primarily in California and New Mexico. He holds a B.A. degree in Anthropology and has participated in all aspects of archaeological fieldwork, including survey, test excavation, data recovery, and construction monitoring. He has extensive familiarity in meeting the cultural resource requirements of CEQA and Section 106 of the NHPA.

4.2 Records Search Methods

A records search for the property was completed at the North Central Information Center (NCIC) of the CHRIS at California State University-Sacramento on 10 July 2015 (NCIC search #PLA-15-75; Attachment A). The purpose of the records search was to determine the extent of previous surveys within a 0.25-mile (400-meter) radius of the proposed project location, and whether previously documented prehistoric or historic archaeological sites, architectural resources, or traditional cultural properties exist within this area.

In addition to the official records and maps for archaeological sites and surveys in Placer County, the following historic references were also reviewed: Historic Property Data File for Placer County (OHP 2012); *The National Register Information System websit*e (National Park Service [NPS] 2015); *Office of Historic Preservation, California Historical Landmarks* website (OHP 2015); *California Historical Landmarks* (OHP 1996 and updates); *California Points of Historical Interest* (OHP 1992 and updates); *Directory of Properties in the Historical Resources Inventory* (1999); *Caltrans Local Bridge Survey* (Caltrans 2015a); *Caltrans State Bridge Survey* (Caltrans 2015b); and *Historic Spots in California* (Kyle 2002).

Other references examined include a RealQuest Property Search and historic General Land Office (GLO) land patent records (Bureau of Land Management [BLM] 2015). Historic maps reviewed include:

- 1855 GLO Plat map for Township 11 North, Range 6 East
- 1893 USGS California, Sacramento Sheet (1:125,000)
- 1910 USGS Roseville, California Sheet (1:62,500)
- 1952 USGS Roseville, California (7.5-minute scale)
- 1967 USGS Roseville, California (7.5-minute scale)

Historic aerial photos taken in 1937 and 1947 were also reviewed for any indications of property usage and built environment.

4.3 Native American Coordination Methods

ECORP contacted the California Native American Heritage Commission (NAHC) on 8 July 2015 to request a search of the sacred land files for the Project Area. The NAHC responded with a list of individuals and organizations in the Native American community that may be able to provide information about unrecorded sites in the project vicinity. (Attachment B).

At the time of the coordination efforts, no federal undertaking or CEQA project had yet been established. ECORP solicited comments from the Native American community regarding potential impacts to tribal cultural resources, but the responsibility to formally consult with the Native American community lies exclusively with the federal and local agencies.

4.4 Other Interested Party Consultation Methods

A letter was sent to the Placer County Historical Society on 9 July 2015 in order to solicit comments or obtain historical information that the repository might have regarding events, people, or resources of historical significance in the area (Attachment A).

4.5 Field Methods

On 10 July and 12 November 2015, the entire Project Area was subjected to an intensive pedestrian survey under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (NPS 1983) using 15-meter transects (Figures 2 and 3). Approximately 0.5 person day was expended in the field. At that time, the ground surface was examined for indications of surface or subsurface cultural resources. The general morphological characteristics of the ground surface were inspected for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the locations of subsurface exposures caused by such factors as rodent activity, water or soil erosion, or vegetation disturbances were examined for artifacts or for indications of buried deposits. No subsurface investigations or artifact collections were undertaken during the pedestrian survey.

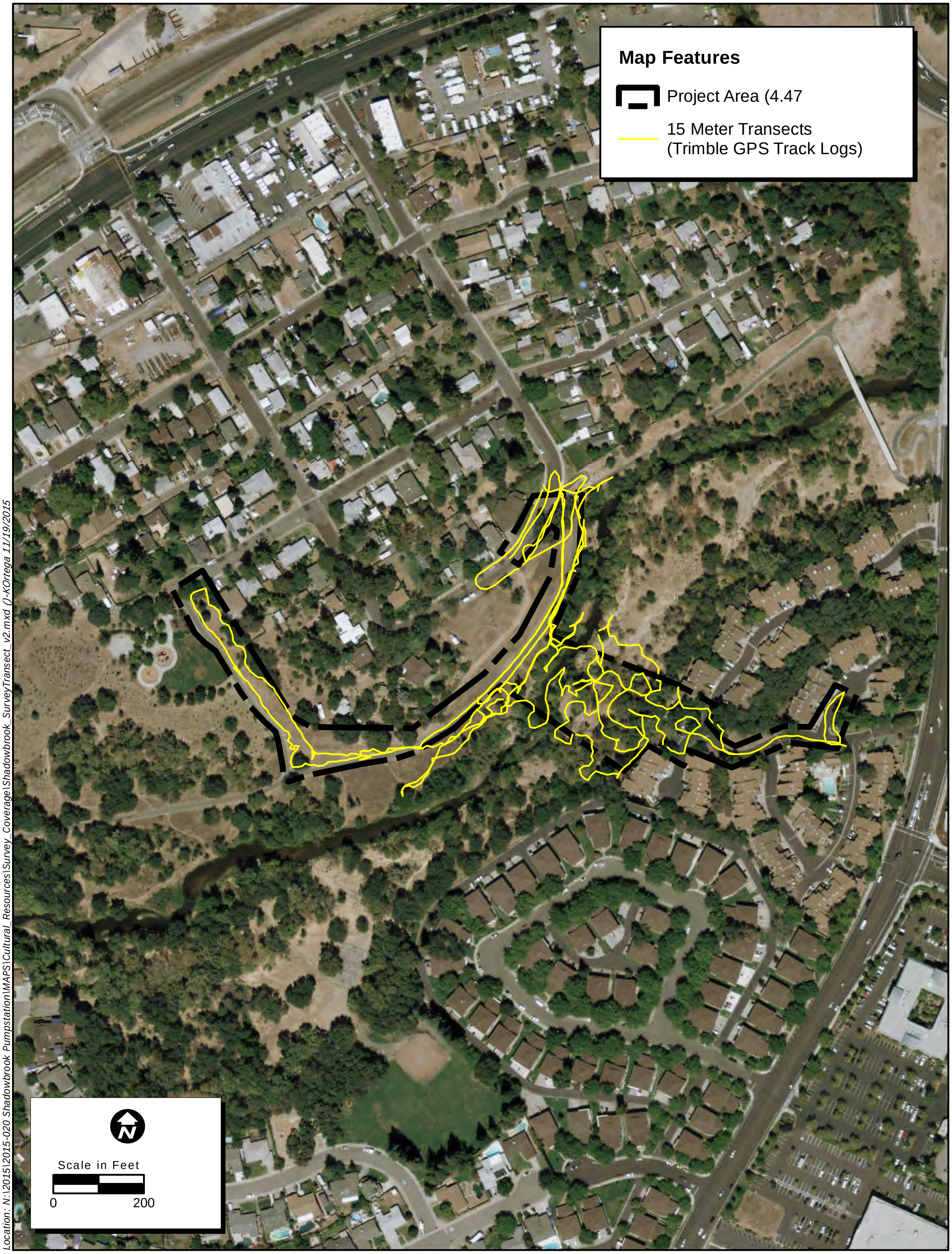
5.0 RESULTS

5.1 Records Search

The records search consisted of a review of previous research and literature, records on file with the NCIC for previously recorded resources, and historical aerial photographs and maps of the vicinity.

5.1.1 Previous Research

Twenty-three previous cultural resource investigations have been conducted within 0.25 mile of the APE, covering approximately 50 percent of the total area surrounding the property within the record search radius (Table 1). These studies revealed the presence of a [redacted]. The previous studies were conducted between 1966 and 2006 and vary in size from less than one acre to 1,632.8 acres.



Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Cultural_Resources\Survey_Coverage\Shadowbrook_SurveyTransect_v2.mxd ()-KOrtega 11/19/2015

Map Date: 11/19/2015
Photo Source:USGS 2013

Figure 3. Survey Transect Interval

2015-020 Shadowbrook Pumpstation

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ENVIRONMENTAL CONSULTANTS

Table 1 – Previous Cultural Studies In or Within 0.25 Mile of the APE

Report Number	Author(s)	Report Title	Year	Area Covered	Includes APE?
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Table 1 – Previous Cultural Studies In or Within 0.25 Mile of the APE

Report Number	Author(s)	Report Title	Year	Area Covered	Includes APE?
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

The results of the records search indicate that portions of the property have been previously surveyed for cultural resources; however, these surveys, all completed separately, did not cover the entire APE and were all conducted over ten years ago. Because these surveys were conducted over ten years ago, they are considered out of date and therefore a current pedestrian survey of the entire APE was warranted.

The records search also determined that [redacted] are located within 0.25 mile of the APE (Table 2).

Table 2 – Previously Recorded Cultural Resources Within 0.25 Mile of the APE

Site Number CA-PLA-	Primary Number P-31-	Recorder and Year	Age/ Period	Site Description	Within APE?
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

5.1.2 Records

The *Office of Historic Preservation's Directory of Properties, Historic Property Data File* (dated 4/5/2012) did not include any resources within 0.25 mile of the Project Area (OHP 2012).

The National Register Information System (NPS 2015) failed to reveal any eligible or listed properties within the 0.25 mile of the Project Area. The nearest National Register property is the Haman House located [redacted] of the Project in Historic Downtown Roseville.

Resources listed as *California Historical Landmarks* (OHP 1996) and on the OHP website (OHP 2015) were reviewed on 10 July 2015. The nearest listed landmark is #780-1: the First Transcontinental Railroad-Roseville (plaque located on the southeast corner of Church Street and Washington Boulevard, approximately [redacted] of the Project Area).

A review of *Historic Spots in California* (Kyle 2002) mentions that a track of the Central Pacific Railroad reached Roseville, which was then called Junction, on April 25, 1864. A marker (SRL 780.1) commemorating the event is located in Depot Park at Washington and Church Streets. In 1908, the Southern Pacific Railroad moved its roundhouse from Rocklin to Roseville, making the city a major railroad center and one of the largest in the western United States.

Historic GLO land patent records from the BLM's patent information database (BLM 2015) revealed that the southeastern quarter of Section [redacted] was patented to the Central Pacific Railroad on 2 July 1864. The federal government granted public land to the railroads, which the railroad could then sell to finance railroad construction. The Project Area land was part of almost 60,000 acres in California granted to the Central Pacific Railroad, which later became part of the Southern Pacific Railroad.

Table 3 – GLO Land Patent Records

Patentee	Patent Date	Serial Number	Patent Type/Authority	Location
Central Pacific Railroad Co.	4/18/1870	CACAAA 039754	July 2, 1864: Grant-RR Northern Pacific (13 Stat. 365)	[redacted]

The Caltrans Local Inventory (Caltrans 2015b) listed two bridges near but not within the Project Area ([redacted]). Bridge [redacted], known as the [redacted], was constructed in 1985. Bridge [redacted], known as the [redacted], was constructed in 1985. Both bridges are modern age and are listed as not eligible for NRHP under Criterion C. No bridges within the record search radius were listed on the Caltrans State Inventory (Caltrans 2015a).

The *Handbook of North American Indians* (Wilson and Towne 1978) lists the nearest Native American village as *Pichiku.* The village is located [redacted] of the City of Roseville, and well outside the current Project Area.

5.1.3 Map Review and Aerial Photographs

The review of historical aerial photographs and maps of the Project Area provide information on the past land uses of the property. Based on this information, the property was initially open space and not utilized for any known function. Following is a summary of the review of historical maps and photographs.

- The 1892 and 1929 USGS California, Sacramento Sheet (1:125,000) maps show the Central Pacific Railroad [redacted] of the Project Area as well as the location just [redacted] of the Project Area where [redacted]
- The 1855 GLO Plat map for Township [redacted] Range [redacted] indicates a "creek" running through the southern portion of Section [redacted]. The map also depicted [redacted] running north-south through the middle of the southwestern quarter of Section [redacted] approximately [redacted] of the Project Area.
- The 1910 USGS Roseville, CA (1:62,500) map shows an auxiliary railroad grade running through the Project Area, connecting with the Southern Pacific Railroad (SPRR) [redacted] of the Project Area (Figure 4). The map also depicts a dirt road heading southeast from an improved road running parallel to and south of the SPRR tracks. This dirt road ends at a structure that appears to be located on a slight rise just north of the Project Area.

[redacted]

Figure 4. 1910 USGS Roseville, CA map, arrow pointing to rail line that traveled through Project Area (USGS 1910).

- Aerial photographs taken in September 1937 show the development of houses uphill from the Project Area as well as few trees and riparian vegetation mainly along the [redacted] The photograph also depicts a crossing over [redacted] approximately [redacted] of the Project area that appears to be connected to an auxiliary rail line following the same path as that shown on the 1910 map (Figure 5). This rail line most likely follows the hillside [redacted] slightly above the creek.

[redacted]

Figure 5. Aerial photograph of the Project Area taken in September 1937.

- Aerial photographs from 1947 show the same amount of neighboring development to the [redacted] as the 1937 photographs and no changes were observed to the land within the Project Area.
- The 1953 USGS Roseville, CA (7.5-minute) map shows development of residences along the [redacted] where the dirt road and associated structure were located in the 1910 map. This development included the addition of [redacted]. The map also identifies the road running parallel to the SPRR tracks as Atlantic Street and the beginning of Highway 80 (identified as the “North Sacramento Freeway, Under Construction”).
- The 1967 USGS Roseville, CA (7.5-minute) map shows the same development and environmental features as on the 1953 map. The only changes between the two maps show a large riparian area (identified in green) along [redacted] and the areas to the south.

5.2 Native American Coordination Results

On 5 August 2015, ECORP received a letter (dated 4 August 2015) from the NAHC stating that the sacred land file search did not indicate the presence of Native American cultural resources in the immediate project area. The letter also provided a list of 13 Native American contacts. Letters were not sent out to the Native American contacts as all Native American coordination efforts beyond initial contact with the NAHC will be carried out by the Federal or local lead agencies. A record of all correspondence is provided in Attachment B.

5.3 Other Interested Party Consultation Results

No responses to the letters sent to the Placer County Historical Society have been received to date.

5.4 Field Survey Results

During the field survey, the majority of the APE was found to consist of the heavily eroded creek bed with developed areas to the [redacted]. The APE [redacted] was completely paved within an apartment complex (Figure 6). No original ground surface was visible in this portion which, according to project plans, will be used as equipment storage, parking, and laydown. The area within the [redacted] had very good surface visibility (60 percent); however, due to the constant water flow, the surface appeared to have been constantly modified. Most of the banks along the creek bed were eroded with exposed sidewalls and constructed trails on top (Figure 7). Overall, the surface was in poor condition as it most likely changes from year to year depending on the creek flow. The northern bank leading up the hill to the northern developed area was slightly eroded and steep (Figure 8).

The area [redacted] of the creek along the graded hillside consisted of the developed bike path, [redacted] and manicured surface surrounding the road and path (Figure 9). A linear strip of the Project Area along the western end bound by [redacted] to the west consisted of a level landscape with short grasses and vegetation. This area yielded approximately 40 percent surface visibility (Figure 10). The surface within the creek bed and hillslopes contained several exposed areas, but no cultural resources were observed within the exposed areas. [redacted]

Attempts were made to locate the auxiliary railroad grade identified on the 1910 USGS topographic map; however, no railroad ties, rails, or raised railroad grade features were identified during the pedestrian survey. A leveled surface along the hillside extending south of the bike path was observed, but it may have been a result of additional grading for equipment staging beyond the bike path. Because no indicators of a railroad grade were present during the survey, it is assumed that the grade was either washed away by erosion from high water flows or was destroyed by construction of the bike path, which may have been designed to follow the grade of the railroad.

[redacted]

Figure 6. East end of APE along [redacted] (view southwest) 10 July 2015.

[redacted]

Figure 7. APE within [redacted] (view southwest) 10 July 2015.

[redacted]

Figure 8. [redacted] (view northeast) 10 July 2015.

[redacted]

Figure 9. Hillside and bike path overview (view northeast) 10 July 2015.

[redacted]

Figure 10. Western end of project (view northwest) 12 November 2015.

As a result of the survey, one isolated [redacted] was located within the Project Area. **SB-001** is an isolate [redacted]

[redacted]

Figure 11. SB-001 isolated [redacted] (detail view), 12 November 2015.

6.0 EVALUATION OF ELIGIBILITY

6.1 Federal Evaluation Criteria

Under federal regulations implementing Section 106 of the NHPA (36 CFR 800), cultural resources identified in the Project APE must be evaluated using NRHP and eligibility criteria. The eligibility criteria for the NRHP are as follows (36 CFR 60.4):

"The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and

a) is associated with events that have made a significant contribution to the broad patterns of our history;

b) is associated with the lives of a person or person's significance in our past;

c) embodies the distinctive characteristics of a type, period or method of construction, or represents the work of a master, or possesses high artistic value, or represents a significant and distinguishable entity whose components may lack individual distinction; or

d) has yielded or may be likely to yield information important in prehistory or history.

In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4).

Effects to NRHP-eligible resources (historic properties) are adverse if the project may alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

6.2 State Evaluation Criteria

Under state law (CEQA) cultural resources are evaluated using CRHR eligibility criteria in order to determine whether any of the sites are Historical Resources, as defined by CEQA. CEQA requires that impacts to Historical Resources be identified and, if the impacts would be significant, that mitigation measures to reduce the impacts be applied.

An Historical Resource is a resource that 1) is listed in or has been determined eligible for listing in the CRHR by the State Historical Resources Commission; 2) is included in a local register of historical resources, as defined in Public Resources Code 5020.1(k); 3) has been identified as significant in an historical resources survey, as defined in Public Resources Code 5024.1(g); or 4) is determined to be historically significant by the CEQA lead agency [CCR Title 14, Section 15064.5(a)]. In making this determination, the CEQA lead agency usually applies the CRHR eligibility criteria.

For this isolate (SB-001), only the fourth definition of an Historical Resource is applicable because there are no resources previously determined eligible or listed on the CRHR, there are no resources included in a local register of historical resources, and no resources identified as significant in a qualified historical resources survey.

The eligibility criteria for the CRHR are as follows [CCR Title 14, Section 4852(b)]:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2. It is associated with the lives of persons important to local, California, or national history.
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association [CCR Title 14, §4852(c)].

Impacts to a Historical Resource (as defined by CEQA) are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired [CCR Title 14, §15064.5(a)].

6.3 Evaluation of SB-001

Isolates are unassociated artifacts or minor features that represent either accidental inclusion or are otherwise disconnected from the human activity that produced it. Isolates typically do not individually contribute to the broad patterns of history because they cannot be connected to a particular event (NRHP Criterion A / CRHR Criterion 1). Isolates are similarly difficult to associate with specific individuals due to their lack of association with archaeological or historical sites, and generally no information exists in the archival record to associate isolates with important individuals in history (NRHP Criterion B / CRHR Criterion 2). Isolates do not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values (NRHP Criterion C / CRHR Criterion 3). Finally, isolates in general do not provide important information in history or prehistory (NRHP Criterion D / CRHR Criterion 4). Therefore, this isolate does not meet the eligibility criteria for inclusion in the NRHP or CRHR as an individual resource, and is neither considered to be a Historic Property for the purpose of Section 106 NHPA, nor a Historical Resource under CEQA.

7.0 MANAGEMENT CONSIDERATIONS

7.1 Conclusions

If the City of Roseville concurs that the [redacted] isolate within the Project Area is not eligible for the CRHR or NRHP and, therefore, is not a Historical Resource for the purpose of CEQA, then no mitigation measures for the prehistoric isolate on the Shadowbrook property will be necessary under CEQA.

Should the project eventually require a federal permit or assistance, the federal lead agency will consult with the State Historic Preservation Officer and Native American tribes under Section 106 of the NHPA.

7.2 Likelihood for Subsurface Cultural Resources

Due to the presence of alluvium along [redacted] and given the likelihood of prehistoric archaeological sites located along perennial waterways, there always exists the potential for buried prehistoric archaeological sites in the APE. Both CEQA and Section 106 of the NHPA require the Lead Agency to address any unanticipated cultural resource discoveries during project construction. Therefore, ECORP recommends the following mitigation measures be adopted and implemented by the Lead Agency to reduce potential adverse impacts to Less than Significant.

If subsurface deposits believed to be cultural or human in origin are discovered during construction, then all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior’s Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, then work may resume immediately and no agency notifications are required.
- If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, then he or she shall immediately notify the City of Roseville as the CEQA lead agency, and applicable landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to their satisfaction.
- If the find includes human remains, or remains that are potentially human, then he or she shall ensure reasonable protection measures are taken to protect the discovery from disturbance (AB 2641). The archaeologist shall notify the Placer County Coroner (per §7050.5 of the Health and Safety Code). The provisions of §7050.5 of the California Health and Safety Code, §5097.98 of the California Public Resources Code, and Assembly Bill 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, then the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the project (Section 5097.98 of the Public Resources Code). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, then the NAHC can mediate (Section 5097.94 of the Public Resources Code). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

The Lead Agency is responsible for ensuring compliance with these mitigation measures because damage to significant cultural resources is in violation of CEQA and Section 106. Section 15097 of Title 14, Chapter 3, Article 7 of CEQA, *Mitigation Monitoring or Reporting*, "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

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LIST OF ATTACHMENTS

Attachment A – Records Search Confirmation and Historical Society Letter

Attachment B – Native American Coordination

Attachment C – Project Area Photographs

Attachment D – Confidential Isolate Location and Isolate Record

ATTACHMENT A

Records Search Confirmation and Historical Society Letter

California
Historical
Resources
Information
System

NORTH CENTRAL
INFORMATION
CENTER

AMADOR
EL DORADO
NEVADA
PLACER
SACRAMENTO
YUBA

California State University, Sacramento
6000 J Street, Folsom Hall, Suite 2042
Sacramento, California 95819-6100
phone: (916) 278-6217
fax: (916) 278-5162
email: ncic@csus.edu

7/10/2015

NCIC File No.: PLA-15-75

Jeremy Adams
ECORP
2525 Warren Drive
Rocklin, CA 95676

Information Center Invoice for
2015-020 Shadowbrook

Staff Processing: hours @ $150/hour

In-House Research: hours @ $100/hour

Staff Assistance/Copies: hours @ $40/hour

Mapped Spatial Features:

Shapefiles: shapes @ $12/shape

Digital Database Record Fee: records @ $0.25/record

Quads:

Copy/Print/PDF: pages @ $0.15/page

PDF Flat Fee:

SUBTOTAL

Rapid response surcharge of 50% of subtotal: **SURCHARGE**

Emergency response surcharge of 100% of subtotal: **SURCHARGE**

Make check payable to: University Enterprises, Inc.

Mail to:
North Central Information Center
6000 J Street, Folsom Hall, Suite 2042
Sacramento, California 95819-6100

Staff: Nathan Hallam

Memo: PLA-15-75

TOTAL

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

8 July, 2015

Placer County Historical Society
P.O. Box 5643
Auburn, CA 95604

RE: Cultural Resources Identification Effort for Shadowbrook Pumpstation Project, Placer County, California T11N, R6E, Section 35 (ECORP Project No. 2015-020).

Dear Placer County Historical Society:

ECORP Consulting, Inc. has been retained to assist in the planning of the development on the project indicated above. As part of the identification effort, we are seeking information from all parties that may have knowledge of or concerns with historic properties or cultural resources in the area of potential effect.

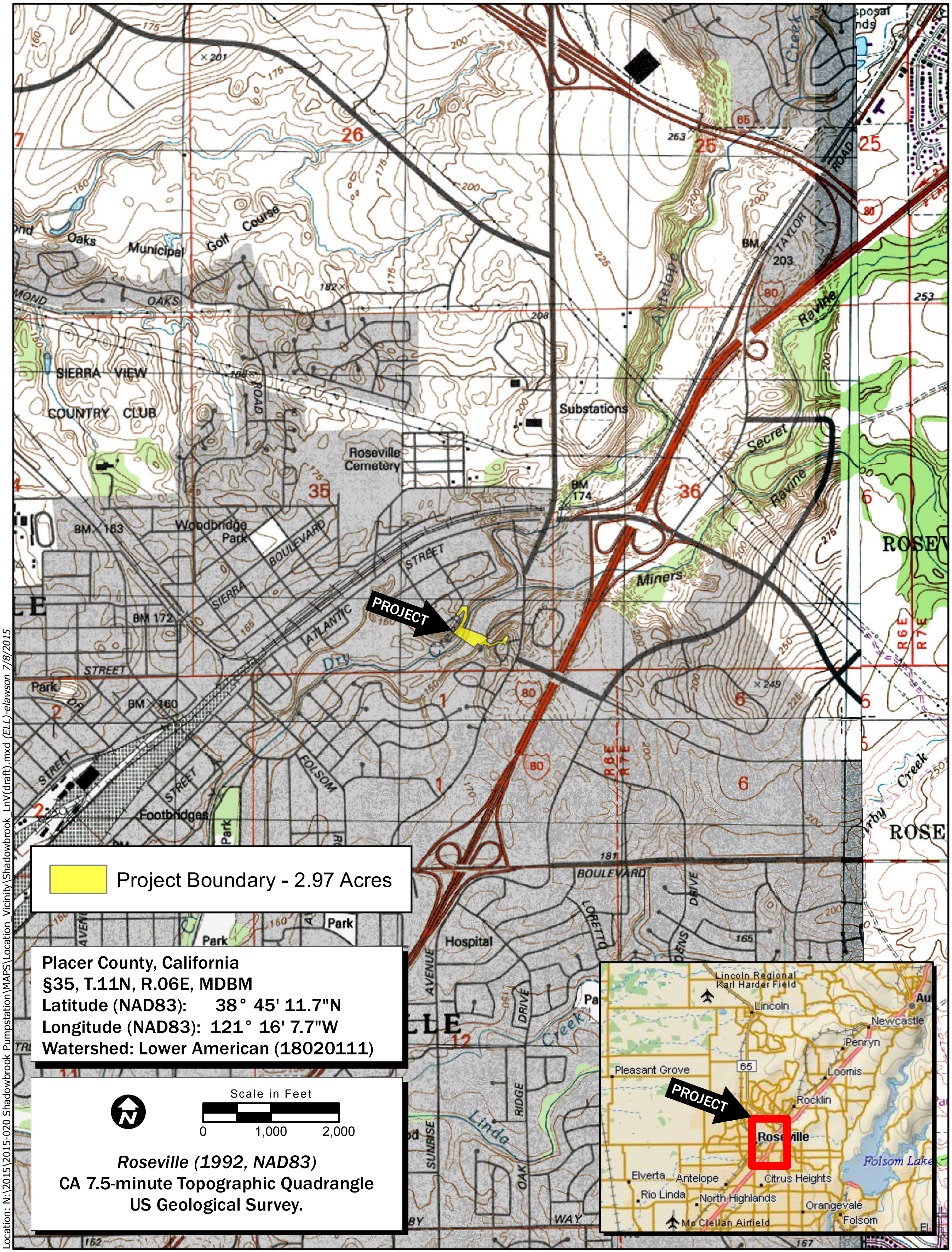
Included are maps showing the project area outlined. We would appreciate input on this undertaking from the historical society with concerns about possible cultural properties or potential impacts within or adjacent to the area of potential effect. If possible, please fax your response to my attention at (916) 782-9134. If you have any questions, please contact me at (916) 782-9100 or spappas@ecorpconsulting.com.

Thank you in advance for your assistance in our cultural resource management study.

Sincerely,

Stephen Pappas
Field Director/Staff Archaeologist

Attachment(s)



🟨 Project Boundary - 2.97 Acres

Placer County, California
§35, T.11N, R.06E, MDBM
Latitude (NAD83): 38° 45' 11.7"N
Longitude (NAD83): 121° 16' 7.7"W
Watershed: Lower American (18020111)

Scale in Feet
0 1,000 2,000

Roseville (1992, NAD83)
CA 7.5-minute Topographic Quadrangle
US Geological Survey.

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Location_Vicinity\Shadowbrook_LnV(draft).mxd (ELL)-elawson 7/8/2015

Map Date: 7/8/2015
Service Layer Credits: Copyright:© 2014 DeLorme

Figure 1. Project Location and Vicinity

2015-020 Shadowbrook Pumpstation

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

ATTACHMENT B

Native American Coordination

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Shadowbrook Pumpstation

County: Placer

USGS Quadrangle: Roseville

Township: 11 North; Range: 6 East; Section: 35

Company/Firm/Agency: ECORP Consulting, Inc.

Contact Person: Stephen Pappas

Street Address: 2525 Warren Drive

City: Rocklin Zip: 95677

Phone: (916) 782-9100

Fax: (916) 782-9134

Email: spappas@ecorpconsulting.com

Project Description: See attached letter and map.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

8 July, 2015

Ms. Debbie Pilas-Treadway
Associate Governmental Program Analyst
Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691

RE: Cultural Resources Identification Effort at Shadowbrook Pumpstation, Placer County, California T11N, R6E, Section 35 (ECORP Project No. 2015-020).

Dear Ms. Pilas-Treadway:

ECORP Consulting, Inc. has been retained to assist in the planning of the development on the project indicated above. As part of the identification effort, we are seeking information from all parties that may have knowledge of or concerns with historic properties or cultural resources in the area of potential effect.

Included is a map showing the project area outlined. We would appreciate the results of your search of the Sacred Lands File and list of tribal contacts who can be contacted to provide input on this undertaking.

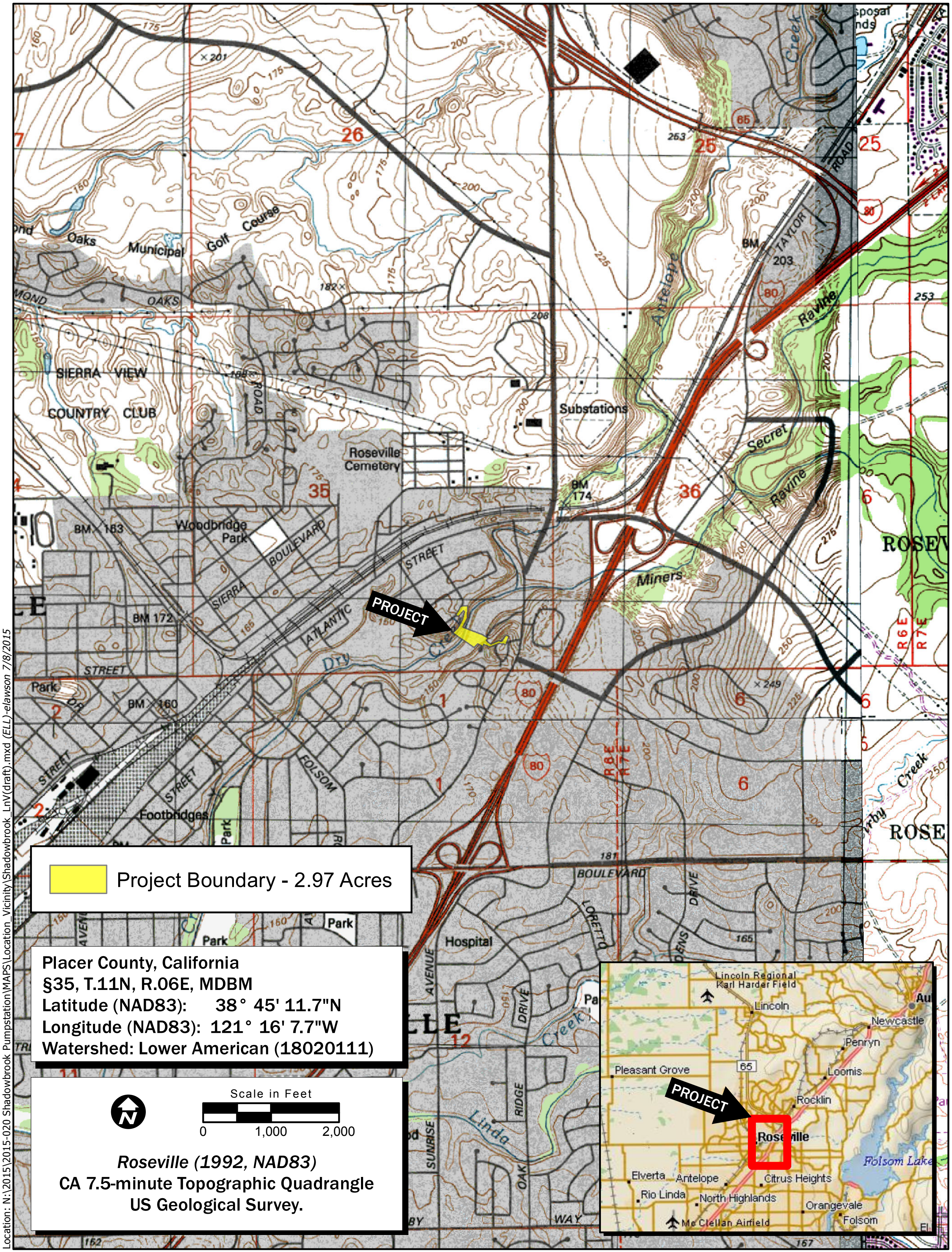
Please email or fax your response to my attention at spappas@ecorpconsulting.com or (916) 782-9134. If you have any questions, please contact me at (916) 782-9100.

Thank you in advance for your assistance.

Sincerely,

Steve Pappas

Stephen Pappas
Field Director/Staff Archaeologist



Placer County, California
§35, T.11N, R.06E, MDBM
Latitude (NAD83): 38° 45' 11.7"N
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Roseville (1992, NAD83)
CA 7.5-minute Topographic Quadrangle
US Geological Survey.

Location: N:\2015\2015-020 Shadowbrook Pumpstation\MAPS\Location_Vicinity\Shadowbrook_LnV(draft).mxd (ELL)-elawson 7/8/2015

Map Date: 7/8/2015
Service Layer Credits: Copyright:© 2014 DeLorme

Figure 1. Project Location and Vicinity

2015-020 Shadowbrook Pumpstation

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

STATE OF CALIFORNIA **Edmund G. Brown, Jr., *Governor***

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471

August 4, 2015

Stephen Pappas
ECORP Consulting, Inc.
2525 Warren Drive
Rocklin, CA 95677

Sent by Fax: (916) 782-9134
Number of Pages: 3

Re: Shadowbrook Pumpstation, Placer County.

Dear Mr. Pappas,

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file 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.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. 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 or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, 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 (916) 373-3712.

Sincerely,

Katy Sanchez

Katy Sanchez
Associate Government Program Analyst

Native American Contact List
Placer County
August 3, 2015

Shingle Springs Band of Miwok Indians
Hermo Olanio, Vice Chairperson
P.O. Box 1340
Shingle Springs, CA 95682
holanio@ssband.org
(530) 676-8010 Office
(530) 676-8033 Fax
Miwok
Maidu

Shingle Springs Band of Miwok Indians
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(530) 676-8033 Fax
Miwok
Maidu

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Maidu
Washoe

T' si-Akim Maidu
Grayson Coney, Cultural Director
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Colfax , CA 95713
(530) 383-7234
Maidu

United Auburn Indian Community of the Auburn Rancheria
Gene Whitehouse, Chairperson
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(530) 883-2390 Office
(530) 883-2380 Fax
Maidu
Miwok

United Auburn Indian Community of the Auburn Rancheria
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(530) 883-2320 Fax
Maidu
Miwok

T' si-Akim Maidu
Eileen Moon, Vice Chairperson
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Grass Valley, CA 95945
(530) 274-7497
Maidu

April Wallace Moore
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Colfax , CA 95713
(530) 637-4279
Nisenan - So Maidu
Konkow
Washoe

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting locative Americans with regard to cultural resources for the proposed Shadowbrook Pumpstation, Placer County.

Native American Contact List
Placer County
August 3, 2015

Shingle Springs Band of Miwok Indians
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Shingle , CA 95682 Maidu
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Lincoln , Ca 95648 Maidu
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(916) 759-8693

Colfax-Todds Valley Consolidated Tribe
Pamela Cubbler
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(530) 274-7497

This list is current only as of the date of this document.

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This list is only applicable for contacting locative Americans with regard to cultural resources for the proposed Shadowbrook Pumpstation, Placer County.

ATTACHMENT C

Project Area Photographs

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PHOTOGRAPH RECORD

Primary #
HRI#
Trinomial

Page 1 of 1 **Resource/Project Name:** Shadowbrook **Year** 2015
Camera: Lens Size: 35mm
Film Type and Speed: Digital Negatives Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
7	10			East end of APE along Rocky Pointe	SW	001
7	10			Overview of drainage along Green Pointe	NE	002
7	10			Intersection of Shadow Ridge and Green Pointe	NW	003
7	10			Overview of central area (shadowbrook PS17)	SW	004
7	10			South bank of Dry Creek	SW	005
7	10			Soil profile south of Dry Creek	SW	006
7	10			Side of hill below bike path from west end of APE	NE	007
7	10			Top of hill/bike path from west end of APE	NE	008
7	10			Area south of bike path	SW	009
7	10			Area north of APE	South	010
7	10			East Street w/in APE	SW	011
7	10			Private property between East Street and bike path	NE	012
7	10			Edge of hill south of bike path	NE	013
7	10			Edge of hill south of bike path	SW	014
7	10			APE overview near creek bed from west end	NE	015
7	10			Creek overview from top of apartment area	NW	016
11	12			Western APE north of Miner’s Ravine Trail	West	001
11	12			Western APE overview	North	002
11	12			Overview of western portion of APE from west end	East	003
11	12			Detail of SB-001	Detail	004
11	12			Detail of SB-001	Detail	005
11	12			Detail of SB-001 (bashed end)	Detail	006
11	12			Detail of SB-001 (fractured end)	Detail	007
11	12			Location overview of SB-001	North	008
11	12			Location overview of SB-001	South	009
11	12			North-central portion of APE north of Miner’s Ravine Trail	NW	010
11	12			North-central portion of APE north of Miner’s Ravine Trail	NE	011
11	12			Eastern end of APE north of Miner’s Ravine Trail	NW	012
11	12			Hill above APE	NW	013


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NO
TRESPASSING










ATTACHMENT D

CONFIDENTIAL Isolate Location and Isolate Record

This Attachment contains information on the specific location of cultural resources. This information in not for publication or release to the general public. It is for planning, management and research purposes only. Information on the specific location of prehistoric and historic sites is exempt from the Freedom of Information Act and California Public Records Act.

APPENDIX D

Geotechnical Report

GEOTECHNICAL REPORT

Shadowbrook Sewer Lift Station and Force Main
Roseville, California

Prepared by:

BLACKBURN CONSULTING
11521 Blocker Drive, Suite 110
Auburn, CA 95603
(530) 887-1494

July 2015

Prepared for:

Hatch Mott MacDonald

Auburn Office:
11521 Blocker Drive, Suite 110 ▪ Auburn, CA 95603
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blackburn
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Fresno Office: (559) 438-8411
Modesto Office: (209) 522-6273
West Sacramento Office: (916) 375-8706

Geotechnical ▪ Geo-Environmental ▪ Construction Services ▪ Forensics

File No. 2794.x
July 28, 2015

Mr. Candido Ramirez
Hatch Mott MacDonald
2495 Natomas Park Drive, Suite 530
Sacramento, CA 95833

Subject: **GEOTECHNICAL DESIGN REPORT**
Shadowbrook Sewer Lift Station and Force Main
Roseville, California

Dear Mr. Ramirez:

Blackburn Consulting (BCI) is pleased to submit this Geotechnical Design Report for the Shadowbrook Sewer Lift Station and Force Main project located in Roseville, California. BCI prepared this report in accordance with our September 26, 2014 proposal.

In this report, we summarize the geotechnical conditions at the pump station site as evaluated from our field investigation and laboratory test data, and provide recommendations for design and construction.

Please call us if you have questions or require additional information.

Sincerely,

BLACKBURN CONSULTING

ROBERT C. PICKARD
No. 2508

THOMAS W. BLACKBURN
No. 2311

Robert Pickard, P.G., C.E.G.
Engineering Geologist

Tom Blackburn, P.E., G.E.
Senior Principal

GEOTECHNICAL DESIGN REPORT

Shadowbrook Sewer Lift Station and Force Main
Roseville, California

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Purpose

Blackburn Consulting (BCI) prepared this Geotechnical Design Report for the Shadowbrook Lift Station and Force Main project. This report presents geotechnical and geologic data, and provides recommendations for design and construction of the new facilities.

BCI prepared this report for Hatch Mott MacDonald (HMM) to use during design and construction of the proposed improvements. Do not use or rely upon this report for different locations or improvements without BCI's written consent.

1.2 Scope of Services

To prepare this report, BCI:

1. Discussed the proposed improvements with HMM
2. Marked boring locations and notified Underground Service Alert
3. Observed, logged, and sampled 4 borings to depths of 11.5 to 49.8 feet below ground surface (bgs)
4. Performed two seismic refraction lines to evaluate the depth to bedrock
5. Performed laboratory tests on soil/rock samples obtained from the exploratory borings
6. Drafted boring logs, site plan, and vicinity map
7. Performed engineering analysis and calculations to develop our conclusions and recommendations

2 SITE AND PROJECT DESCRIPTION

2.1 Site Location and Description

The sewer lift station is located in the Shadowbrook apartment complex approximately 75 feet west of the intersection of Shadow Ridge and Green Pointe. The sewer force main will extend to the northwest from the lift station under Dry Creek to the Miners Ravine Bike Trail to tie into the existing Dry Creek Interceptor Sewer. The lift station is at latitude 38.7533º and the longitude is -121.2697º. Figure 1 shows the general site location.

Topography in the project area ranges from essentially level (at the existing lift station) to slightly to steeply sloping (on fill slopes and in the Dry Creek channel area). Elevations in the project area vary from approximately 160 feet (in the area of the proposed storage pipes) to 139 feet at Dry Creek (based on topography by Andregg Geomatics). The existing lift station is located at approximate elevation of 152.4 feet. Figure 2 shows site details. The new pump station will rehabilitate and/or replace the existing lift station and force main.

2.2 Project Description

The new sewer lift station will consist of the following primary components:

- Existing wet well rehab
- If rehabilitation is not feasible a new wet well will be constructed (extending to a depth of approximately 13 ft) at the site of the existing wet well
- Added back-up generator
- Raising the finished lift station floor grade to an elevation a minimum 12 inches above the 100 year flood plain
- New redundant force main that crosses Dry Creek
- Underground emergency storage pipes (labeled as storage pipes on Figure 2)

2.3 Project Geology

The Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierra Foothills, California (Helly and Harwood, 1985) shows the lift station and northwest end of the force main to be immediately underlain by unconsolidated gravel, sand, and silt of the Upper Riverbank Formation. Mapping shows the channel area to be immediately underlain by alluvial material that consists of gravel, sand, and silt.

Contrary to the published mapping our investigation observed alluvial sediments overlying deposits of the Mehrten Formation. In the project area, the Mehrten Formation consists of mudflow tuff breccia and volcanic derived sandstones that are typically moderately weathered. The breccia are typically hard and the sandstones are typically soft depending on the degree of cementation, and degree of weathering.

2.4 Faulting

The Fault Activity Map of California (Jennings and Bryant, 2010) and the Geologic Map of the Sacramento Quadrangle (Wagner, 1987) do not identify Historic or Holocene age faults (displacement within the last 11,700 years) at or adjacent to the project. The nearest mapped fault is located 13.5 miles northwest of the site (Foothills Fault System, Dewitt Fault) and is Late Quaternary in age (displacement in the last 700,000 years).

The project site is not within or adjacent to an Alquist–Priolo Earthquake Fault Zone (Bryant and Hart, 2007). The nearest fault classified as an Alquist–Priolo Earthquake Fault Zone is the Cleveland Hill Fault located over 47 miles north of the project. Ground rupture and/or fault creep are not expected to occur at the site and do not influence design recommendations. See Section 6.2 for seismic recommendations and conclusions.

3 FIELD INVESTIGATION AND LABORATORY TESTING

3.1 Exploratory Borings

BCI drilled and sampled four exploratory borings on April 2 and April 3, 2015. Boring depths ranged from 11.5 to 49.8 feet bgs. BCI planned the boring locations and depths based on the proposed improvements and site access. See Appendix A for methodology and boring logs and Figure 2 (Site Plan) for boring locations.

3.2 Seismic Refraction Profiling

BCI performed 2 seismic refraction surveys on April 3, 2015 to acquire data in the channel area. Figure 2 shows the approximate location of each seismic line. Appendix B contains the results of the seismic surveys with methodology and Seismic Profiles.

3.3 Laboratory Testing

We completed the following laboratory tests on representative soil/rock samples from our exploratory borings:

- Moisture Content (ASTM D 2216) and Unit Weight (ASTM D 2937) for soil classification and in-place soil/rock characteristics.
- Plasticity Index (ASTM D 4318) for soil classification and soil characteristics.
- Sieve Analysis (ASTM D 6913) for soil classification and soil characteristics.
- Unconfined Compression (ASTM D 7012) for rock strength.
- Direct Shear Test Results (ASTM D 3080) for rock strength.
- Corrosivity Tests (Sulfate - CTM 417, Chloride – CTM 422, pH and Resistivity - CTM 643) to evaluate corrosion potential.
- Compaction Curve (ASTM D 1557) for soil characteristics.

We attach laboratory test results in Appendix C and show on the boring logs where appropriate.

4 SUBSURFACE CONDITIONS

4.1 Soil and Rock Conditions

Our subsurface investigation and review of existing information indicate that the site is underlain by alluvial deposits that are underlain by volcanic breccias and volcanic derived sandstones of the Mehrten Formation. Figure 3 shows the alignment profile and Table 1 summarizes the rock conditions encountered in our borings.

TABLE 1: Summary of Subsurface Conditions			
Boring No.	**General Description**	**Boring Depth**	**General Soil and Rock Conditions**
B1	Proposed Pit for Trenchless Crossing	49.8 ft	0-12.8 ft – Fill, medium dense, Clayey Sand with scattered boulders. 12.8-19.2 ft – Moderately weathered, hard, Volcanic Breccia. Core recovery 100% and RQD* 100%. 19.2-49.8 – Moderately weathered, weakly cemented Sandstone. Core recovery 60% to 100% and RQD* from 52% to 100%**.
B2	Proposed Pit for Trenchless Crossing	41.5 ft	0-8 ft – Loose Silty Sands and Stiff, Sandy Silt, Fill 8-16.6 ft – Medium dense to very dense, poorly graded Sands and Gravels. 16.6-38.7 ft – Moderately weathered moderately hard to hard Volcanic Breccia. Core recovery 100% and RQD* 74% to 100%. 38.7-41.5 - Moderately weathered, weakly cemented Sandstone. Core recovery 74% and RQD* from 74% to 100%**.
B3	Proposed Generator Pad	11.5 ft	0-8.5 ft – Loose Silty Sands and Stiff, Sandy Silt, Fill. 8.5-11.5 ft – Dense, poorly graded Gravel with Sand.
B4	Potential Emergency Underground Storage Pipes	21.5 ft	0-8.5 ft – Stiff, Sandy lean Clay; Fill 8.5-16.3 – Medium Dense, Silty Sand, Fill 16.3-21.5 – Medium Dense to dense, poorly graded Sands and Gravels

*RQD = Rock Quality Designation, defined as the sum of length of solid core pieces greater than 4 inches long divided by the total length of core run
**RQD for weakly cemented/unsound Sandstones

Our Seismic Profiles (Appendix B) recorded seismic velocities that range from ±1,000 to greater than ±8,000 feet per second (fps). Based on mapped ground conditions and the materials encountered in borings and test pits, the following seismic velocities are applicable:

- Un-saturated and saturated Alluvium and/or residual soils/weathered rock - 1,000 to 5,000 fps
- Intensely to Slightly Weathered rock - 5,000 to greater than 8,000 fps, depending on composition and weathering conditions

Shallow groundwater in the area influences the interpretation of the depth to rock. Velocities of 3,000 to 5,000 fps represent either saturated soils (water has a seismic velocity of approximately 5,000 fps) or residual soil and/or weathered rock. We estimate material with a velocity of approximately 5,000 fps or greater represents rock of the Mehrten Formation, which will be difficult to excavate with conventional equipment such as a large backhoe to moderate size excavator.

The 5,000 fps horizon is at approximately elevation 138.5 to 131 feet along SR1 (north to south) and elevation 138 to 129.5 feet along SR2 (north to south).

The volcanic breccia in the area can weather erratically due to composition. This often results in variable depths to hard rock over relatively short lateral distances. The refraction surveys reflect average rock conditions; harder or softer rock may occur at depths different than that shown on the profiles.

Refer to the boring logs (Appendix A) and Seismic Profile Sheets (Appendix B) for more specific subsurface conditions encountered at each location. We further discuss soil and rock excavatability and seismic velocity correlation below.

4.2 Groundwater

We encountered groundwater in B2 (lift station location) at 10.25 feet below existing grade (Elev. 141.5 feet) and in B4 (potential storage pipes locations) at 19.5 feet below existing grade (Elev. 141.2 feet). We did not observe groundwater in B3. We did not measure groundwater in B1 due to the presence of residual drill fluids. The groundwater elevation is likely linked to the water levels in Dry Creek and perched groundwater is likely to occur above the hard rock that underlies the site, particularly during or shortly following the wet season. Some groundwater is also likely to occur within the fractured rock.

5 CORROSION EVALUATION

5.1 Soil Corrosivity

We tested two samples for corrosion characteristics (pH, resistivity, chlorides, and sulfates). See Table 2 for results:

TABLE 2: Laboratory Soil Corrosivity Results

Boring Location	Sample No./ Depth (ft)	pH	Minimum Resistivity (ohm-cm)	Chloride (mg/kg)	Sulfate (mg/kg)
B2	1/ 2.5 -3.0	6.45	3,480	13.6	10.2
B4	3/ 10.5 -11.0	6.42	5,630	8.7	7.6

Laboratory tests indicate negligible sulfate exposure for the representative soil sample (American Concrete Institute (ACI) 318-14 Table 19.3.1.1). Based on Caltrans guidelines (2012) for corrosive soil conditions, the site is considered non-corrosive.

A corrosion engineer should review these results and provide additional corrosion testing and mitigation recommendations if necessary.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Facility Ground Suitability

The site will be suitable for the planned improvements when constructed in accordance with the project plans, industry standards, and our geotechnical recommendations. Some of the more significant site limitations include rocky conditions that will require specific trenchless drilling considerations, relatively shallow groundwater that may require dewatering for lift station construction, and shallow older fills.

6.2 Seismic Design

Based on geologic mapping and subsurface exploration, the site is underlain by shallow rock and considered Site Class "C" (California Building Code, 2013). For seismic design, use the values in Table 3.

TABLE 3: Seismic Design Parameters (CBC 2013) Shadowbrook Lift Station– Site Class C	
S_s – Mapped Acceleration Parameter	0.501 g
S_1 – Mapped Acceleration Parameter	0.250 g
F_a – Site Coefficient	1.2
F_v – Site Coefficient	1.55
S_{MS} – MCE* Spectral Response Acceleration, Short Period	0.601
S_{M1} – MCE* Spectral Response Acceleration, 1-Second Period	0.387
S_{DS} – 5% Damped Design Spectral Response Acceleration, Short Period	0.400
S_{D1} – 5% Damped Design Spectral Response Acceleration, 1-Second	0.258
T_L – Long-Period Transition Period	12

* Maximum Considered Earthquake

6.3 Liquefaction

Liquefaction can occur when loose to medium dense, granular, and certain soft, fine grained, saturated soils (generally within 50 feet of the surface) are subjected to ground shaking. In general the saturated sediments encountered in our borings below the groundwater table are medium dense to dense and have low risk for liquefaction.

6.4 Excavation

We expect that excavations above elevation 135 feet on the east bank and from approximately 141 to 148 feet on the west bank will generally be achievable with traditional medium sized excavation equipment. Deeper excavations may encounter excavation difficulty in the Mehrten Formation. We summarize the estimated excavation conditions in Table 4.

TABLE 4: Estimated Excavation Conditions

Location*	Approximate Rock Elevation* (ft) /Rock Type	Strength of Rock (psi)	RQD	Likely Excavation Requirements
West Pit (Boring B1)	143**- Volcanic Breccia 137- Sandstone	467 178-291	100 28-100	Heavy excavation equipment facilitated by chiseling where hard rock is encountered
East Pit (Boring B2)	135- Volcanic Breccia 113- Sandstone	331-807 178-291	74-100 100	Heavy excavation equipment facilitated by chiseling where hard rock is encountered
SR1	136	N/A	N/A	Heavy excavation equipment facilitated by chiseling where hard rock is encountered
SR2	134	N/A	N/A	Heavy excavation equipment facilitated by chiseling where hard rock is encountered

*Approximate depth - rock hardness, fracturing, and excavatability can vary considerably
** Upper 12.8 feet consisted of fill. Outcrop of volcanic breccia is upslope of the boring location.

At the potential underground emergency storage pipe locations, B3 and B4, our borings did not encounter rock to the full depth of exploration (11.5 feet and 21.5 feet respectively).

Excavations will require sloping and/or shoring in accordance with Cal OSHA requirements. Based on our subsurface exploration, preliminary excavation and shoring design may be based on Type C soil, granular soils including gravel and sand (see Cal OSHA regulations). Type C soils extend from the ground surface to elevations of approximately135 to 143 feet (borings B2 and B1 respectively) with Stable Rock below that. In B4 Type C soils extended to an elevation of approximately 139 feet (the full depth of exploration).

For Type C soil conditions, slope excavations at 1.5(H):1(V); for Stable Rock, cut excavations vertically with review by an engineering geologist for adverse-dipping discontinuities (foliation and fracture).

The contractor is responsible for the safety of all excavations and should provide appropriate excavation sloping and shoring in accordance with current Cal OSHA requirements (based on actual soil and rock conditions encountered) and observe conditions during construction for necessary modification and safety.

6.5 Dewatering

Groundwater was recorded in B2 (at the proposed boring pit) at an elevation of approximately 141 feet. Dewatering will likely be required for installations below this level. We expect significant groundwater inflow quantities. Groundwater likely corresponds to the level of Dry Creek and is perched on the top or hard rock and likely occurs in fractures within the rock. Extensive dewatering (such as multiple sumps, sheet piles, etc.) will likely be necessary. The contractor is responsible for dewatering design and construction.

6.6 Grading

6.6.1 Site Clearing and Original Ground Preparation

Prior to making cuts and fills, remove debris and paving materials, strip vegetation to a minimum depth of 2 inches below the ground surface, and remove brush and trees including the roots. Widen excavations resulting from brush or tree removal to provide access for compaction equipment.

Do not use strippings within engineered fill. Strippings can be placed in the upper 2 feet of landscape areas (non-structural locations) if approved by the landscape architect.

Prior to placing fill on stripped, overexcavated, or cut ground surfaces, scarify the ground surface to a minimum depth of 8 inches. Moisture condition the scarified soil to within 3% of optimum and compact it to a minimum of 90% relative compaction based on ASTM D 1557 test procedure.

6.6.2 Building Pad Overexcavation and Fill

Due to the potential for detrimental loose soils in the upper 3 feet of the pump station and generator location (area of borings B2 and B3 as described in Table 1), overexcavate and fill the building pad areas as described below:

- At all building locations overexcavate soils within the building footprint and to 5 feet beyond the building to a depth of 3 feet below finish soil subgrade (the lateral extent can be reduced if necessary and approved by the project engineer and BCI so as not to impact existing improvements).
- Scarify the base of overexcavated areas to a depth of 8 inches.
- Moisture condition the bottom of the excavation to 0%-3% above optimum moisture content.
- Compact the exposed subgrade soil to a minimum 90% relative compaction based on ASTM D1557.
- To fill the overexcavated area, provide on-site and/or import fill that meets the following requirements:
  - Classified as Silt (ML), Silty/Clayey Sand (SM/SC), Silty/Clayey Gravel (GM/GC)
  - Contains no concentrations of organics, debris, and other deleterious materials
  - Maximum particle size of 4 inches
  - 20%-70% passing the #200 sieve

  - Expansion index less than or equal to 20 (per ASTM D4829), or a Plasticity Index less than 12 (per ASTM D4318)
  - Import material should be approved by BCI prior to its delivery to the site.
- Place fill in maximum 8 inch thick loose lifts.
- Moisture condition the soil to within 0%-3% above optimum.
- Compact the soil to a minimum 90% relative compaction based on ASTM D1557.

It may be difficult to obtain satisfactory materials from soil excavated on-site (due to Expansion Index and Plasticity); plan for import of suitable material.

6.6.3 General Fill and Compaction

On-site soil may be used as fill outside of the building pad. Fill should be free of debris and concentrations of organic material.

Unless otherwise approved by the project engineer, fill should contain no rocks larger than 4 inches in greatest dimension. If concentrations of rock occur, thoroughly mix soil and rock to prevent nesting and voids.

Place fill in maximum 8-inch thick loose lifts, moisture condition to within 0%-3% above optimum and compact to a minimum of 90% relative compaction. Base relative compaction and optimum moisture content on the ASTM D 1557 test procedure.

If the fill is not testable for compaction because of the quantity of rock; moisture condition thoroughly as recommended by BCI, and compact each 8-inch lift with a minimum of 5 to 7 passes of a Caterpillar 825 sheepsfoot compactor or the equivalent. BCI may modify the number of passes and lift thickness during construction based on the compaction equipment used and material type being placed.

6.6.4 Slope Stability and Slope Construction

Construct cut or fill slopes at a gradient of 2:1 or flatter. Vegetate slopes or use a suitable ground cover to mitigate erosion. Surface drainage must be directed away from slopes and to drainage facilities.

6.7 Foundations

Foundation dimensions (width and length) and loading were not available at the time of this report.

The site will be suitable for conventional footings (i.e., continuous strip, isolated spread footings and thickened slab) provided the designers and contractors follow our design and construction recommendations. We expect footings for the control building and any other at-grade structures to be founded on compacted engineered fill.

Use the following foundation design parameters:

- Embed continuous strip and isolated footings a minimum of 18 inches into the prepared subgrade
- Footings must be a minimum of 18 inches wide and sized not to exceed the allowable bearing capacity
- Use an allowable bearing capacity of 2,000 psf
- Bearing capacity may be increased by one-third if seismic and/or wind loads are included.
- To resist lateral movement, use a coefficient of friction of 0.45 and passive earth pressure of 280 psf per foot of embedment depth. Use a passive earth pressure up to 350 psf per foot of embedment if lateral movements of up to 2% of the foundation embedment depth can be tolerated. Both friction and passive earth pressure can be combined for lateral resistance; when combined, increase the safety factor against sliding from a minimum of 1.5 to 2.0. Ignore the upper one-foot of footing depth for passive pressure calculations.
- We expect total and differential settlement to be less than 1 inch (over an approximate length of 25 feet).

Clean all foundation excavations of debris and loose soil prior to placing concrete. Slope the ground surface away from the structure at a minimum of 2 percent for a distance of 5 feet to prevent ponding of water adjacent to the structure.

6.8 Concrete Slabs-On-Grade

6.8.1 Slab Underlayment

Provided the contractor(s) prepares the building pads in accordance with our grading recommendations and any addendums by BCI, a concrete slab-on-grade floor may be used. Assuming a bare concrete floor (no floor covering), underlay the concrete slabs with a minimum of 4 inches of washed, crushed, and compacted rock to provide uniform support. Crushed rock used beneath floor slabs should be graded so that 100% passes the ¾ inch sieve and less than 5% passes the No. 4 sieve. Compact moisture conditioned crushed rock with at least two passes of a vibratory type compactor.

Exterior flatwork such as sidewalks, etc. may be placed directly on the prepared subgrade without rock underlayment. The subgrade should be free of debris, uniformly compacted, and thoroughly wetted (3% or more above optimum in the upper 6 inches) before the concrete is placed. Flatwork must be properly jointed to allow for slab shrinkage and movement. ACI provides recommendations on slab jointing based on slab thickness, location, and use.

6.9 Lift Station Wet Well

6.9.1 Lateral Earth Pressure

The following At-Rest lateral earth pressure will apply for design of the lift station wet well in native soil:

- Undrained equivalent fluid weight of 94 pcf
- Drained equivalent fluid weight of 62 pcf
- Seismic increase of 7 pcf

The earth pressures assume:

- Backfill placed against the structure wall in accordance with our recommendations
- Level backfill conditions
- Backfill that consists of native soils (silty sand and gravel, or decomposed rock that can be classified as silty sand or sandy silt with gravel) and/or imported, granular soils that meet the requirement for structure backfill, or CLSM
- Total compacted, moist unit weight of approximately 130 pcf
- Minimum internal angle of friction of 32 degrees
- Drained condition assumes groundwater cannot accumulate in the backfill (backfill is drained)

For static design, apply the resultant of the static earth pressure at a distance of 0.33H above the base of the structure where H equals the wall height in feet.

For seismic design, calculate the resultant of incremental lateral soil pressure due to seismic loading based on an equivalent fluid pressure of 7 pcf. Apply the magnitude of the resultant seismic pressures at 0.5H from the base of the structure. Add the resultant of the seismic earth pressure to the resultant of the static earth pressure.

A uniform surface load of 200 to 300 psf is often used to approximate construction and traffic loading on structure walls. However, these values should be reviewed by the designer to determine if they are adequate based on anticipated loads. To evaluate surcharge loads, use a coefficient of at-rest lateral earth pressure (k_o), equal to 0.47.

If the structure will be designed for drained conditions, provide adequate drainage to avoid build-up of hydrostatic pressures behind the structure. Positive drainage for structure walls should consist of a vertical layer of permeable material, such as a graded sand and gravel (graded to meet Caltrans Standard Specifications for Class 1, Type A Permeable Material), pea gravel, or crushed rock, at least 12 inches thick, positioned between the retaining wall and the backfill.

If pea gravel or crushed rock is used, place a nonwoven filter fabric between it and the backfill to prevent the drain from becoming clogged. A synthetic drainage fabric, such as Enkadrain (Colbond Geosynthetics Co.), Miradrain (TC Mirafi) or an equivalent, may be substituted for the permeable layer. Assure that the filter part of the material faces the backfill. Remove collected water by installing perforated drainage pipe along the bottom of the permeable material or drainage fabric slope towards suitable drainage facilities (i.e., sump pump).

6.9.2 Structure Backfill

Native soils (silty sand and gravel) will generally be suitable for structure backfill provided concentrations of clay soils, organics, and oversize material are excluded. Approved granular import material can be also be used as structure backfill.

Moisture condition backfill to within 2 percent of optimum and place in maximum 8-inch thick, horizontal, loose lifts. Compact backfill to a minimum 90 percent relative compaction based on the ASTM D 1557 test procedure.

In order to minimize the residual lateral earth pressures on structure walls, compaction equipment used behind the walls must be restricted (by load and distance from wall) so that wall design values are not exceeded. For this reason, we recommend compaction within a horizontal distance equal to one-half of the wall height, up to a distance of 5 feet, with hand-operated equipment (e.g. jumping jack).

To minimize the potential for significant settlement of backfill around the lift station, Controlled Low Strength Material (CLSM) can be used to backfill to the surface or to a manageable backfill depth (e.g. 10 feet below grade).

6.9.3 Buoyancy Resistance

We recorded groundwater at approximate elevation of 141.5 feet in the area of the lift station. Groundwater may be higher at other times, particularly during winter months. Assume groundwater can reach an elevation equal to the maximum design water level in Dry Creek.

For undrained conditions, below grade structures may be subjected to an uplift load (buoyancy). The uplift force will be resisted by the weight of the structure. Other methods for uplift resistance include:

- Foundation extensions - use the weight of backfill overlying foundation extensions. Use a backfill unit weight of 130 pcf above groundwater and 68 pcf below groundwater to calculate the resistance due to the weight of the soil. Use a wedge extending up from foundation extensions at an angle of 30 degrees from vertical to determine the weight of soil resisting uplift.
- Frictional resistance – use skin friction from surrounding soils. The frictional resistance will vary with depth but can be assumed as follows (apply a factor of safety of at least 2 to determine the allowable uplift resistance):
  - For structure backfill against a concrete structure:
    - 15 psf per foot of depth where above the design groundwater level
    - 8 psf per foot of depth when below the design groundwater level

6.10 Emergency Storage Pipes and Miscellaneous Piping

6.10.1 Emergency Storage Pipe Loading

Based on our work in the area and the material types on the site, we expect that native backfill compacted to a minimum 90 percent (per ASTM D 1557) will have a moist unit weight of approximately 130 pcf and a submerged unit weight of 68 pcf.

6.10.2 Subgrade, Bedding and Pipe Zone Material

We expect that excavation for emergency storage pipe installation and miscellaneous piping will be within silty sands and poorly graded gravels. Although we do not anticipate soft, unsuitable pipe subgrade at any particular location; notify the project engineer and BCI for review and mitigation recommendations if encountered. To achieve a stable and non-yielding subgrade suitable for pipe placement and backfilling, typical mitigation may include replacement of unsuitable subgrade with ¾-inch minus crushed rock (minimum of 6 inches), enclosed in geotextile filtration fabric such as Mirafi 140N (or equivalent).

Support pipe/tank on a minimum of 4-inches of granular bedding and in accordance with the manufacturer's recommendations. City of Roseville, Environmental Utilities Department, General Construction Specifications show the following parameters for pipe bedding and initial backfill material (which extends to 1 foot above the top of pipe):

Material Gradation:

Sieve Size	Percent Passing by Weight
¾ -inch	100 for pipe over 12 inches
½ -inch	100 for pipe 12 inches and smaller
3/8 -inch	>50
No. 8	>10

Sand Equivalent = Minimum of 25

Native soils may contain a significant amount of fines (passing #200 sieve) and will not be suitable for bedding or pipe zone backfill.

BCI considers CLSM suitable as alternative bedding and pipe zone backfill material.

6.10.3 Backfill and Compaction

Since the project is located within the City of Roseville, follow backfill requirements in the City of Roseville, Design and Construction Standards, "Sewer Main Trench and Backfill", Plates SS-1 and/or other Placer County approved backfill methods.

Trench backfill (intermediate backfill) may consist of excavated soils. Fill should be free of debris and concentrations of vegetation or clay soils. If import fill is required for trench backfill, it should be graded and have material properties as follows:

- 100% passing the 3-inch sieve
- 20% to 50% passing the #200 sieve
- Plasticity Index not greater than 20
- Liquid Limit less than 35
- Expansion Index not greater than 20

Follow the pipe/tank manufacturer's requirements for initial backfill to avoid damage. To facilitate compaction in the pipe zone area (top of bedding up to 12 inches above pipe), use a trench width that provides a minimum clearance of 12 inches between the pipe and trench wall; significantly greater width will be necessary for compaction of materials around the 48 or 60 inch diameter storage tank/pipe sufficient to allow access for equipment and personnel.

Moisture condition backfill to within 2% of optimum moisture content and compact to a minimum 90% relative compaction (based on ASTM 1557). Use a maximum compacted lift thickness of 8 inches unless field performance testing can demonstrate adequate compaction of thicker lifts. Jetting is not acceptable for compaction.

6.11 Dry Creek Pipeline Crossing

We evaluated soil/rock conditions for pipeline installation using B1, B2, and Seismic Refraction lines SR1 and SR2 located at or near the crossing.

Table 5 summarizes subsurface conditions in B1, located west of Dry Creek. We did not measure groundwater in this boring.

TABLE 5: B1 Subsurface Conditions

Material	Approximate Elevation (ft)	RQD	Cohesion (psi)	Phi	Unconfined Strength of Rock (psi)
Medium Dense Clayey Sand (older abandoned trench backfill)	156-143				
Volcanic Breccia	143-137	100			467
Sandstone/Siltstone	137-106 (total boring depth)	28-100	12.8*	52*	178-291**

*Sandstone
**Siltstone

Table 6 summarizes subsurface conditions in B2, located east of Dry Creek. Groundwater was at 10.3 feet bgs (approximate elevation of 141.5 feet).

TABLE 6: B2 Subsurface Conditions

Material	**Approximate Elevation (ft)**	**RQD**	**Cohesion (psi)**	**Phi**	**Unconfined Strength of Rock (psi)**
Stiff to Very Stiff Sandy Silt	151.8-143.8				
Medium Dense Silty Sand and Poorly Graded Gravel	143.8-135.3				
Volcanic Breccia	135.3-113	74-100			331-807
Sandstone	113-110.3 (total boring depth)				

We located the refraction line SR1 in the overbank deposits east of Dry Creek near elevation 143 feet. Refraction line SR2 was on a sand bar on the east bank of Dry Creek near elevation 140 feet. Based on the seismic velocities, it appears that hard rock is located at depths of approximately 7 to 8 feet (SR2 and SR1 respectively) below the ground surface (elevation 134 to 136 feet).

Trenchless techniques (including directional drilling and bore and jack methods), and traditional cut and cover methods are geotechnically feasible at this location.

We discuss construction considerations for proposed method below.

6.11.1 Trenchless Pipeline Crossing

Trenchless installations are geotechnically feasible at this location; however, there are geotechnical and environmental factors which may affect the implementation of different methods as discussed below. We include preliminary recommendations for directional drilling, tunneling, and bore and jack construction. The contractor should select trenchless methods that do not cause significant settlement, avoid “frac-out” (expulsion of the drilling mud to the surface) into creeks, and that maintain the design horizontal and vertical pipe alignments and tolerances. Determination of scour depths is beyond our scope of work.

Pipe crossing depths should be located to avoid future scour. Our seismic refraction lines indicate rock is present outside the channel at elevations of approximately 137 to 134 feet. For installations within hard rock, locate pipes below an elevation of 120 feet and well below channel invert to avoid interception of deep scour and/or frac-out.

6.11.1.1 Directional Drilling Recommendations

A directional drilling installation is geotechnically possible at this location. However, potential for “frac-out” into Dry Creek is a significant environmental concern and may limit approval of this method. The rock encountered in our borings was slightly to moderately fractured. Potential for “frac-out” will be minimized if crossings occur at sufficient depth below top of rock. We recommend crossings should be below an elevation of 120 feet.

Typical minimum cover for this type of crossing is 25 feet (for competent soils). Variable subsurface conditions will be encountered during drilling and will likely include:

- Loose to medium dense sands in the upper 10 to 16 feet that will present some risk of borehole caving and casing may be required to extend through some loose sand horizons.
- Hard volcanic breccia.
- Soft to Moderately Soft Sandstones and Siltstones that may be weakly cemented and present some risk of caving.

Goundwater will be present within drilling depths; consider a maximum depth to water of 5 feet at the bank locations (about consistent with the elevation of water in Dry Creek).

6.11.1.2 Tunneling and Bore and Jack Recommendations

Tunneling and Bore and Jack methods may encounter difficult excavation conditions for construction of boring and receiving pits. Expect to encounter:

- Loose, caving, granular soil.
- Shallow groundwater.
- Hard volcanic breccia that will be difficult to excavate with conventional equipment and/or weakly cemented sandstones that will have a higher risk of caving.

Additional investigation should be performed to verify the depth to rock at the boring pit and if feasible along the alignment.

6.11.2 Open Cut Pipeline Crossing

Open cut construction is feasible. Expect to encounter loose, caving, granular soil, shallow groundwater, and hard volcanic breccia. Significant seepage into open excavations should be anticipated and extensive shoring and dewatering will be required. If volcanic breccia is encountered it will be difficult to excavate with conventional equipment.

City of Roseville Environmental Utilities Department Standard Drawing SS-9 requires pipe creek crossings supported on 8x36 steel H-piles. If the pipeline is installed in native intact volcanic breccia and the pipe zone backfilled with controlled low strength material (CLSM) no additional support is needed. If the pipeline is installed in the overlying alluvium, follow the City of Roseville standard. The standard drawing specifies support H piles with a minimum length of 30 feet. H-piles will be unable to be driven into the hard volcanic breccia below approximate elevation 136 feet. Piles will need to be predrilled into the volcanic breccia and grouted into place. Predrilled holes through alluvial materials will be subject to caving and will likely require casing. Predrilled holes extending into the Sandstone may also encounter caving conditions and require casing. Seepage into excavations will occur. Assume coring and wet construction methods will be needed.

6.11.3 Excavation and Shoring Design

Excavations at boring and receiving pits will generally encounter loose to medium dense, granular soils that may be saturated below the water elevation in Dry Creek. The granular soils are underlain at elevations of approximately 135 to 143 feet by moderately hard to hard volcanic breccia. Open excavations 5 feet or deeper (e.g., boring and receiving pits) will require sloping and/or shoring in accordance with Cal OSHA requirements. Based on our subsurface exploration and laboratory testing, preliminary excavation and shoring design may be based on Type C soil (see Cal OSHA regulations) to depths of 13 to 16 feet.

Sheetpiles, if utilized for shoring/groundwater control will likely encounter refusal to driving at the rock interface. Sheetpiles may require bracing. The contractor is responsible for final excavation and shoring design and construction based on actual excavation conditions

6.11.3.1 Excavation Dewatering

We observed relatively shallow groundwater at the boring pit at approximate elevation of 141.5 feet. Extensive dewatering (such as multiple sumps, sheet piles, etc.) may be necessary depending on the depth of the boring pit. The contractor is responsible for dewatering design and construction.

6.11.3.2 Pit Bottom Support

Based on our subsurface exploration and anticipated conditions, the bottom of boring and receiving pits will be founded in medium dense sand or gravels and/or volcanic breecia. We expect pit floors to be stable. A compacted aggregate or concrete base may be necessary to achieve a level pit floor. Extensive dewatering may be necessary.

6.11.3.3 Pit Thrust Wall Design

For design of thrust walls at a depth of 5 feet or greater, use an ultimate passive earth pressure of 420 pounds per square foot, per foot of depth up to a maximum depth of 10 feet (triangular pressure distribution). This value should be reduced by an appropriate factor of safety and adjusted if necessary for actual soil/rock conditions exposed.

6.11.3.4 Pit Backfill

On-site soil is suitable for pit backfill provided it is free of concentrations of organics and particles larger than 6 inches in maximum dimension. Condition backfill to within two percent of optimum moisture content and place backfill in loose lifts no greater than 8 inches thick. Compact the soil to a minimum of 92% relative compaction (per ASTM D 1557).

7 CONSTRUCTION ISSUES

In summary, some construction issues of potential significance include the following:

- If construction proceeds during the winter/spring months and shortly following (wet season), wet surficial soil conditions can create handling and mixing difficulty, and over-optimum soil moisture conditions for site work, backfill, and compaction.
- Difficult rock excavation may be encountered if excavations extend below approximate elevations of 135 feet (east side) or 143 feet (west side).
- Dewatering is likely to be required for construction of the lift station and possibly the emergency storage pipes. The need for dewatering will be greater during the winter/spring months.
- Variable soil/rock conditions for trenchless construction methods.
- Caving soils and difficult pile installation for a cut and cover crossing.

8 RISK MANAGEMENT

Our experience and that of our profession clearly indicates that the risks of costly design, construction, and maintenance problems can be significantly lowered by retaining the geotechnical engineer of record to provide additional services during design and construction. For this project, we recommend that the project owner retain us to:

- Review and provide comments on the civil plans and specifications prior to construction.
- Monitor construction to check and document our report assumptions. At a minimum, BCI should observe footing excavations, trench excavations, approve backfill, and test backfill compaction.
- Update this report if design changes occur, 2 years or more lapses between this report and construction, and/or site conditions have changed.

If we are not retained to perform the above applicable services, we are not responsible for any other party's interpretation of our report, and subsequent addendums, letters, and discussions.

9 LIMITATIONS

BCI performed services in accordance with generally accepted geotechnical engineering principles and practices currently used in this area. Where referenced, we used ASTM and California Test Method standards as a general (not strict) guideline only. We do not warranty our services.

BCI based this report on the current site conditions. We assume the soil, rock, and groundwater conditions encountered in our explorations are representative of the subsurface conditions throughout the site. Conditions at locations other than our explorations could be different.

See Appendix A for bore logs and Figure 3 for a site profile. The lines designating the interface between soil/rock types are approximate. The transition between material types may be abrupt

or gradual. Our recommendations are based on the final log, which represents our interpretation of the field logs and general knowledge of the site and geological conditions.
The groundwater elevations discussed in this report represent the groundwater elevation during the time of our subsurface exploration and at the exploration locations. The groundwater table may be lower or higher in the future and at other locations.

This is a relatively complicated geologic site. And, modern design and construction are complex, with many regulatory sources/restrictions, involved parties, construction alternatives, etc. It is common to experience changes and delays. The owner should set aside a reasonable contingency fund based on complexities and cost estimates to cover changes and delays.

10 REFERENCES

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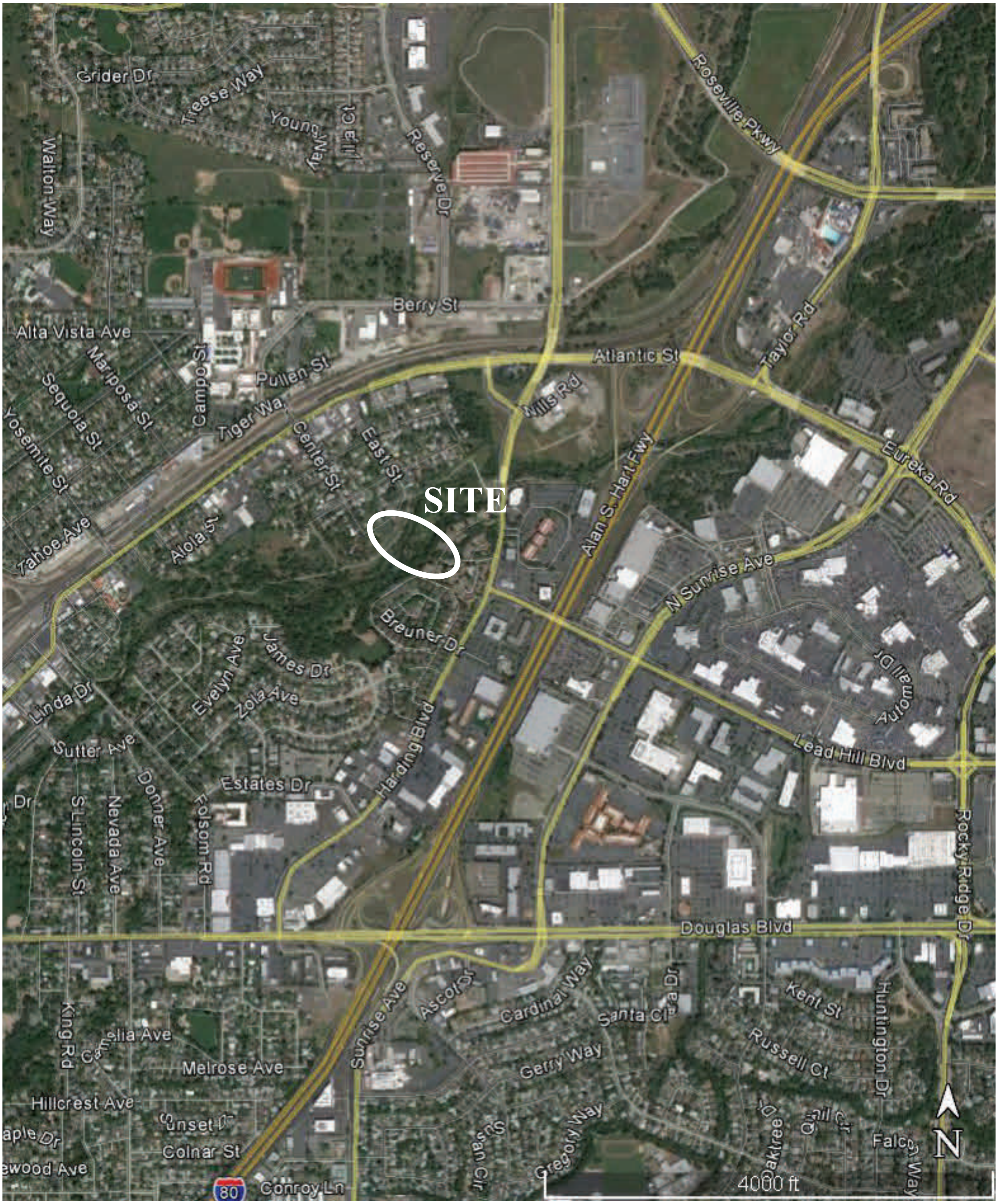
FIGURES



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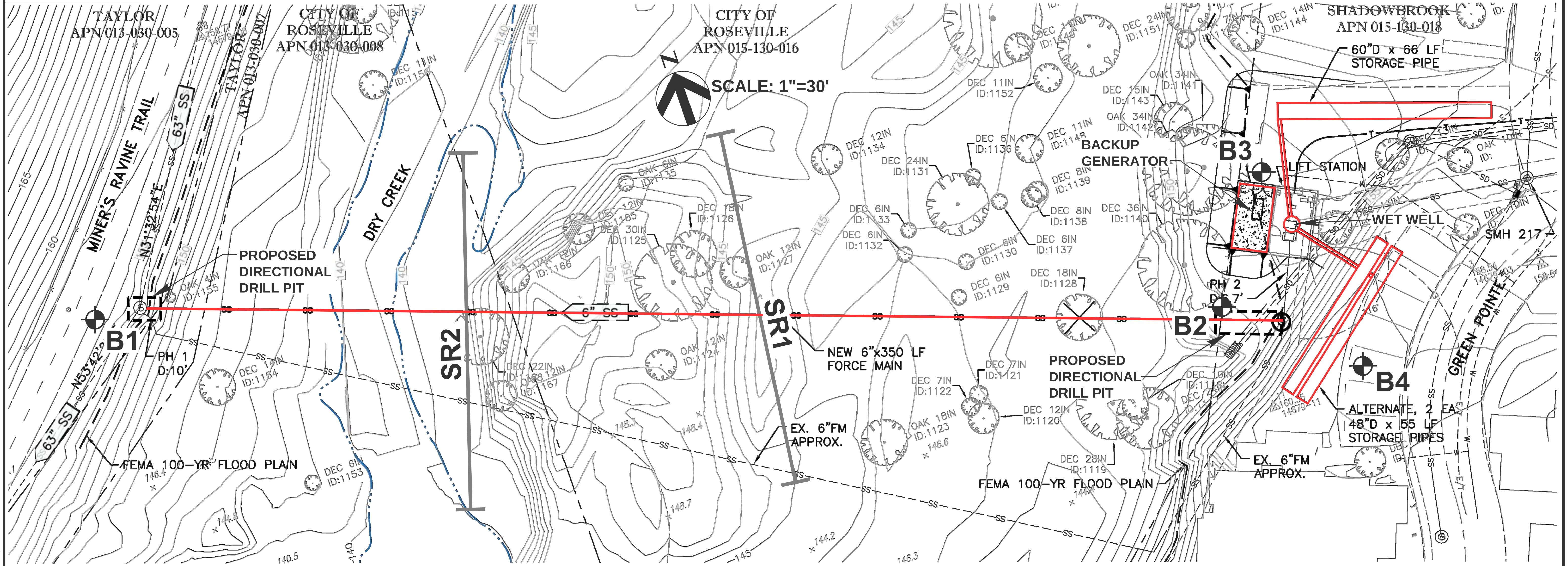
VICINITY MAP

Shadowbook Sewer Lift Station and Force Main
Roseville, California

File No. 2794.x

July 2015

Figure 1



LEGEND

B1 ⊕ Approximate Boring Location

SR1 Approximate Refraction Seismic Line Location

🟥 Proposed Improvements

SOURCE: Topography by Andregg Geomatics, March 2015. Site improvements by HMM, April 2015.

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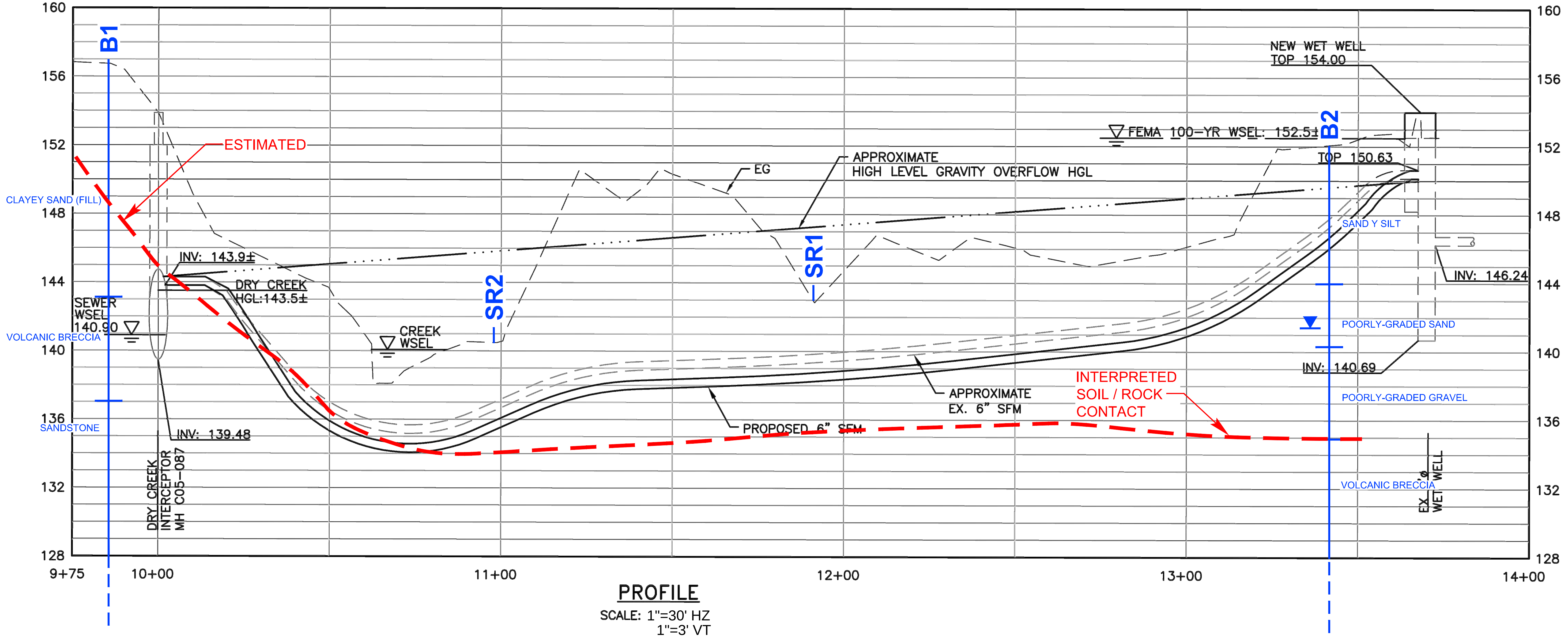
SITE PLAN
Shadowbrook Pump Station
Roseville, California

File No. 2794.x
July 2015
Figure 2

2794.x Fig2 Shadowbrook Pump Station.dwg



PROFILE

SCALE: 1"=30' HZ
1"=3' VT

SOURCE: Preliminary Draft 06-19-2015, Plan and Profile drawing SFM1, Sta. 10+00 to 10+XX, Sheet C-01 by Hatch Mott MacDonald, dated 03/27/15.

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SITE PROFILE
Shadowbrook Pump Station
Roseville, California

File No. 2794.x
July 2015
Figure 3

2794.x Fig2 Shadowbrook Pump Station.dwg

APPENDIX A

Exploratory Drilling Methodology

Boring Logs, Legend of Boring Logs

Core Photographs

Exploratory Drilling Methodology

Our drilling subcontractor (Taber Drilling) drilled the borings with solid-stem (4-inch diameter) auger techniques in soil and penetrable rock. Harder, more competent rock was drilled and sampled with HQ wire-line coring techniques. We obtained soil samples at various intervals using either a 3.0-inch O.D. Modified California (MC) sampler (equipped with 2.4-inch diameter brass liners) or a 2.0-inch O.D. (1.4-inch I.D.) Standard Penetration Test Sampler (SPT). Taber drove samplers were with an automatic hammer, weighing 140-pounds and falling approximately 30 inches.

Rob Pickard, C.E.G., logged the borings and retrieved samples for laboratory testing. We used plastic caps to seal and label the 2.4-inch diameter, 6-inch long brass tubes retrieved from MC sampling. Samples from SPT sampling were placed in labeled zip lock bags. We also retrieved bulk soil samples from soil cuttings. We placed rock core samples in labeled core boxes (see photographs in Appendix A).

LOGGED BY **RCP**
BEGIN DATE **4-2-15**
COMPLETION DATE **4-2-15**
BOREHOLE LOCATION (Lat/Long or North/East and Datum) **38.753513° / -121.270923°**
HOLE ID **B1**
DRILLING CONTRACTOR **Taber**
BOREHOLE LOCATION (Offset, Station, Line)
SURFACE ELEVATION **~156.0 ft**
DRILLING METHOD **HQ Core**
DRILL RIG **CME 45**
BOREHOLE DIAMETER **4 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **2.5" Cal Mod, SPT, HQ Core**
HAMMER TYPE **Safety semi-automatic drop (140#/ 30")**
HAMMER EFFICIENCY, ERi **80%**
BOREHOLE BACKFILL AND COMPLETION **Grout backfilled 4/2/15**
GROUNDWATER READINGS DURING DRILLING **Not measured** AFTER DRILLING (DATE)
TOTAL DEPTH OF BORING **49.8 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (tsf)	Additional Lab Tests	Drilling Method	Casing Depth
	0		6" Aggregate Base																
	1		CLAYEY SAND with GRAVEL; medium dense; olive brown; moist; FILL		Bag A			100											
154.00	2				1	5 14 15	29	100											
	3									14	111								
152.00	4																		
	5				2	9 14 50/4"	64/10	100											
150.00	6									16	107								
	7		Boulder 6.6-7.8 ft		Run 1			75	50										
148.00	8				Run 2			0	0										
	9																		
146.00	10																		
	11																		
144.00	12																		
	13		VOLCANIC BRECCIA; massive; brown; moderately to slightly weathered; hard; slightly fractured		Run 3			100	100										
142.00	14																		
	15																		
140.00	16																		
	17									17	106				UU = 67295				
138.00	18				Run 4			100	100										
	19																		
136.00	20		SANDSTONE; fine to medium sandstone; massive; olive brown moderately weathered; very soft; slightly fractured																
	21																		
134.00	22																		
	23				Run 5			60	52	24	95				UU = 41910				
132.00	24																		
	25																		

(continued)

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PROJECT NAME **Shadowbrook Lift Station**
FILE NO. **2794.X**
HOLE ID **B1**
COUNTY **PLA**
ROUTE
POSTMILE
CLIENT **Hatch Mott MacDonald**
PREPARED BY **RCP**
CHECKED BY **PFF**
SHEET **1 of 2**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (tsf)	Additional Lab Tests	Drilling Method	Casing Depth
	25																		
130.00	26		SILTSTONE; fine grained; massive; brown; moderately weathered; very soft; moderately soft to moderately hard; slightly fractured		Run 5			60	52										
	27																		
128.00	28		SANDSTONE; fine to medium sandstone; dark olive brown; moderately weathered; very soft; slightly fractured		3	15 22 47	69	100											
	29																		
126.00	30				Run 6			63	63										
	31																		
124.00	32																		
	33				Run 7			100	28	25	85			51.9	DS = 1836		DS		
122.00	34																		
	35																		
120.00	36																		
	37		SILTSTONE; fine grained; massive; brown; moderately weathered; very soft; moderately soft to moderately hard; slightly fractured																
118.00	38				Run 8			100	100	33	84				UU = 25624				
	39																		
116.00	40																		
	41		SANDSTONE; fine to medium grained; massive; dark olive brown; moderately weathered; very soft; slightly fractured																
114.00	42																		
	43				Run 9			90	90										
112.00	44																		
	45																		
110.00	46																		
	47																		
108.00	48				Run 10			100	100										
	49																		
106.00	50																		
	51		Bottom of exploration at 49.8 ft bgs Grout backfilled 4/2/15																
104.00	52																		
	53																		
102.00	54																		
	55																		

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PROJECT NAME **Shadowbrook Lift Station**		FILE NO. **2794.X**	HOLE ID **B1**
COUNTY **PLA**	ROUTE		POSTMILE
CLIENT **Hatch Mott MacDonald**			
PREPARED BY **RCP**	CHECKED BY **PFF**		SHEET **2 of 2**

LOGGED BY **RCP**	BEGIN DATE **4-2-15**	COMPLETION DATE **4-3-15**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **38.753127° / -121.269781°**	HOLE ID **B2**
DRILLING CONTRACTOR **Taber**			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION **~151.8 ft**
DRILLING METHOD **HQ Core**			DRILL RIG **CME 45**	BOREHOLE DIAMETER **4 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **2.5" Cal Mod, HQ Core**			HAMMER TYPE **Safety semi-automatic drop (140#/ 30")**	HAMMER EFFICIENCY, ERi **80%**
BOREHOLE BACKFILL AND COMPLETION **Grout backfilled 4/3/15**			GROUNDWATER READINGS — DURING DRILLING **10.3 ft** — AFTER DRILLING (DATE) **10.3 ft on 4-2-15**	TOTAL DEPTH OF BORING **41.5 ft**

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (tsf)	Additional Lab Tests
	0	SILTY SAND; SM; loose; olive brown; moist														
	1															
149.80	2			1	4 2 3	5	100		13	114					PP = 2.25 tsf	CR
	3	SANDY lean CLAY; CL; stiff to very stiff; olive brown; moist														
147.80	4															
	5			2	3 3 5	8	100		9	104		15			PP = 4.0 tsf	PI
145.80	6															
	7															
143.80	8	Poorly Graded SAND with SILT; SP; medium dense; brown to olive brown; moist to wet														
	9															
141.80	10	▼		3	7 9 15	24	100		19 14	101 116	5					PA
	11															
139.80	12	Poorly graded GRAVEL with SAND; medium dense; olive brown; wet; fine gravel with interbedded Poorly Graded SAND; SP; medium dense to dense; olive brown; wet														
	13															
137.80	14															
	15			4	27 22 50/5"	72/11	100									
135.80	16	Poorly graded GRAVEL; very dense; mottled brown and olive brown; wet; medium to coarse gravel; weakly cemented														
	17			Run 1			100	0								
133.80	18	VOLCANIC BRECCIA; massive; brown; moderately to slightly weathered; moderately hard to hard; slightly fractured		Run 2			100	74								
	19															
131.80	20															
	21								18	110				UU = 116248		
129.80	22			Run 3			100	80								
	23															
127.80	24															
	25															

(continued)

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PROJECT NAME **Shadowbrook Lift Station**		FILE NO. **2794.X**	HOLE ID **B2**
COUNTY **PLA**	ROUTE		POSTMILE
CLIENT **Hatch Mott MacDonald**			
PREPARED BY **RCP**	CHECKED BY **PFF**		SHEET **1 of 2**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (tsf)	Additional Lab Tests	Drilling Method	Casing Depth
	25																		
125.80	26				Run 3			100	80	3	119				UU = 109353				
	27				Run 4			100	94										
123.80	28																		
	29																		
121.80	30																		
	31																		
119.80	32				Run 5			100	100	18	103				UU = 47680				
	33																		
117.80	34																		
	35																		
115.80	36																		
	37				Run 6			74	74										
113.80	38																		
	39		SANDSTONE; massive; brown; moderately weathered; soft to moderately soft; moderately fractured																
111.80	40																		
	41																		
109.80	42																		
	43																		
107.80	44																		
	45																		
105.80	46																		
	47																		
103.80	48																		
	49																		
101.80	50																		
	51																		
99.80	52																		
	53																		
97.80	54																		
	55																		

Bottom of exploration at 41.5 ft bgs

Grout backfilled 4/3/15

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PROJECT NAME **Shadowbrook Lift Station**	FILE NO. **2794.X**	HOLE ID **B2**
COUNTY **PLA**	ROUTE	POSTMILE
CLIENT **Hatch Mott MacDonald**		
PREPARED BY **RCP**	CHECKED BY **PFF**	SHEET **2 of 2**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
RCP	**4-3-15**	**4-3-15**	**38.753381° / -121.269751°**	**B3**

DRILLING CONTRACTOR **Taber**	BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION **~153.0 ft**
DRILLING METHOD **Solid-Stem Auger**	DRILL RIG **CME 45**	BOREHOLE DIAMETER **4 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **2.5" Cal Mod**	HAMMER TYPE **Safety semi-automatic drop (140#/ 30")**	HAMMER EFFICIENCY, ERi **80%**
BOREHOLE BACKFILL AND COMPLETION **Grout backfilled 4/3/15**	GROUNDWATER READINGS — DURING DRILLING **None** — AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING **11.5 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (tsf)	Additional Lab Tests	Drilling Method	Casing Depth
	0		SILTY SAND with GRAVEL; SM; loose; brown; moist; fine to medium sand		Bag B			100									CP		
	1																		
151.00	2				1	4 4 5	9	100		25	90					PP = 2.0 tsf			
	3		SANDY SILT; ML; stiff to very stiff; olive brown; moist																
149.00	4																		
	5				2	3 4 5	9	100		13	116					PP = 2.0-3.5 tsf			
147.00	6																		
	7																		
145.00	8																		
	9		Poorly graded GRAVEL with SAND; GP; dense; olive brown; wet																
143.00	10				3	27 18 20	38	100											
	11																		
141.00	12																		
	13		Bottom of exploration at 11.5 ft bgs Grout backfilled 4/3/15																
139.00	14																		
	15																		
137.00	16																		
	17																		
135.00	18																		
	19																		
133.00	20																		
	21																		
131.00	22																		
	23																		
129.00	24																		
	25																		

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PROJECT NAME **Shadowbrook Lift Station**	FILE NO. **2794.X**	HOLE ID **B3**
COUNTY **PLA**	ROUTE	POSTMILE
CLIENT **Hatch Mott MacDonald**		
PREPARED BY **RCP**	CHECKED BY **PFF**	SHEET **1 of 1**

LOGGED BY **RCP**	BEGIN DATE **4-3-15**	COMPLETION DATE **4-3-15**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **38.1753257° / -121.269668°**	HOLE ID **B4**
DRILLING CONTRACTOR **Taber**			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION **~160.7 ft**
DRILLING METHOD **Solid-Stem Auger**			DRILL RIG **CME 45**	BOREHOLE DIAMETER **4 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **2.5" Cal Mod**			HAMMER TYPE **Safety semi-automatic drop (140#/ 30")**	HAMMER EFFICIENCY, ERi **80%**
BOREHOLE BACKFILL AND COMPLETION **Grout backfilled 4/3/15**			GROUNDWATER READINGS — DURING DRILLING **19.5 ft** — AFTER DRILLING (DATE) **19.3 ft on 4-3-15**	TOTAL DEPTH OF BORING **21.5 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (tsf)	Additional Lab Tests	Drilling Method	Casing Depth
	0		1.5" ASPHALT																
	1		4" AGGREGATE BASE		Bag C			100											
158.70	2		SANDY lean CLAY; CL; stiff to hard; olive brown to medium gray; moist; FILL; with scattered organics		1	6 7 10	17	100		18	120					PP = 1.75 tsf			
	3																		
156.70	4																		
	5				2	12 17 19	36	100								PP = 4.5+ tsf			
154.70	6																		
	7																		
152.70	8																		
	9		SILTY SAND; SM; medium dense; olive brown; moist; fine to medium sand																
150.70	10				3	5 4 8	12	100		10	112	37					PA		
	11																		
148.70	12																		
	13																		
146.70	14																		
	15				4	7 6 9	15	100		13	101						CR		
144.70	16																		
	17		Poorly graded SAND; SP; medium dense; olive brown; moist																
142.70	18																		
	19 ▼ ▽		Poorly graded GRAVEL with SAND; GP; dense; brown; moist to wet																
140.70	20				5	17 18 15	33	100		11	131								
	21																		
138.70	22																		
	23		Bottom of exploration at 21.5 ft bgs Grout backfilled 4/3/15																
136.70	24																		
	25																		

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PROJECT NAME **Shadowbrook Lift Station**		FILE NO. **2794.X**	HOLE ID **B4**
COUNTY **PLA**	ROUTE		POSTMILE
CLIENT **Hatch Mott MacDonald**			
PREPARED BY **RCP**	CHECKED BY **PFF**		SHEET **1 of 1**

GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names	Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435-04)
CL	Collapse Potential (ASTM D 5333-03)
CP	Compaction Curve (CTM 216 - 06)
CR	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
CU	Consolidated Undrained Triaxial (ASTM D 4767-02)
DS	Direct Shear (ASTM D 3080-04)
EI	Expansion Index (ASTM D 4829-03)
M	Moisture Content (ASTM D 2216-05)
OC	Organic Content (ASTM D 2974-07)
P	Permeability (CTM 220 - 05)
PA	Particle Size Analysis (ASTM D 422-63 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
PL	Point Load Index (ASTM D 5731-05)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301 - 00)
SE	Sand Equivalent (CTM 217 - 99)
SG	Specific Gravity (AASHTO T 100-06)
SL	Shrinkage Limit (ASTM D 427-04)
SW	Swell Potential (ASTM D 4546-03)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
UW	Unit Weight (ASTM D 4767-04)
VS	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- 2.5" ID Sampler
- 2" ID Sampler
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- ▽ First Water Level Reading (during drilling)
- ▼ Static Water Level Reading (short-term)
- ▼ Static Water Level Reading (long-term)

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BORING RECORD LEGEND

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	Pocket Penetrometer (tsf)	Torvane (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60} - Value (blows / foot)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Descriptor	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE

Descriptor		Size
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS

Descriptor	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION

Descriptor	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

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BORING RECORD LEGEND

ROCK GRAPHIC SYMBOLS

☒	IGNEOUS ROCK
▤	SEDIMENTARY ROCK
▨	METAMORPHIC ROCK

BEDDING SPACING

Descriptor	Thickness or Spacing
Massive	> 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8 inches to 1 ft
Thinly bedded	1-1/4 to 3-5/8 inches
Very thinly bedded	3/8 inch to 1-1/4 inches
Laminated	< 3/8 inch

WEATHERING DESCRIPTORS FOR INTACT ROCK

	Diagnostic Features					
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering and Grain Boundary Conditions	Texture and Solutioning		
Descriptor	Body of Rock	Fracture Surfaces		Texture	Solutioning	General Characteristics
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No solutioning	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull	Minor to complete discoloration or oxidation of most surfaces	No visible separation, intact (tight)	Preserved	Minor leaching of some soluble minerals may be noted	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty"; feldspar crystals are "cloudy"	All fracture surfaces are discolored or oxidized	Partial separation of boundaries visible	Generally preserved	Soluble minerals may be mostly leached	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation (refer to grain boundary conditions)	All fracture surfaces are discolored or oxidized; surfaces are friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Altered by chemical disintegration such as via hydration or argillation	Leaching of soluble minerals may be complete	Dull sound when struck with hammer; usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures or veinlets. Rock is significantly weakened.
Decomposed	Discolored of oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay		Complete separation of grain boundaries (disaggregated)	Resembles a soil; partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes".

Note: Combination descriptors (such as "slightly weathered to fresh") are used where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant identifiable zones can be delineated. Only two adjacent descriptors shall be combined. "Very intensely weathered" is the combination descriptor for "decomposed to intensely weathered".

RELATIVE STRENGTH OF INTACT ROCK

Descriptor	Uniaxial Compressive Strength (psi)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

CORE RECOVERY CALCULATION (%)

$$\frac{\Sigma \text{ Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

RQD CALCULATION (%)

$$\frac{\Sigma \text{ Length of intact core pieces > 4 in.}}{\text{Total length of core run (in.)}} \times 100$$

ROCK HARDNESS

Descriptor	Criteria
Extremely Hard	Specimen cannot be scratched with pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows
Very hard	Specimen cannot be scratched with pocket knife or sharp pick; breaks with repeated heavy hammer blows
Hard	Specimen can be scratched with pocket knife or sharp pick with heavy pressure; heavy hammer blows required to break specimen
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure; breaks with moderate hammer blows
Moderately Soft	Specimen can be grooved 1/6 in. with pocket knife or sharp pick with moderate or heavy pressure; breaks with light hammer blow or heavy hand pressure
Soft	Specimen can be grooved or gouged with pocket knife or sharp pick with light pressure, breaks with light to moderate hand pressure
Very Soft	Specimen can be readily indented, grooved, or gouged with fingernail, or carved with pocket knife; breaks with light hand pressure

FRACTURE DENSITY

Descriptor	Criteria
Unfractured	No fractures
Very Slightly Fractured	Lengths greater 3 ft
Slightly Fractured	Lengths from 1 to 3 ft, few lengths outside that range
Moderately Fractured	Lengths mostly in range of 4 in. to 1 ft, with most lengths about 8 in.
Intensely Fractured	Lengths average from 1 in. to 4 in. with scattered fragmented intervals with lengths less than 4 in.
Very Intensely Fractured	Mostly chips and fragments with few scattered short core lengths

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BORING RECORD LEGEND

B1 6.6 – 20.3 ft

B1 20.3 – 34.0 ft

B1 34 – 42.8 ft

B1 42.8 – 49.8 ft

B2 16.4 - 24.6 ft

B2 24.6 – 33.6 ft

B2 33.6 – 41.5 ft

APPENDIX B

Seismic Refraction Methodology
Seismic Velocity Profiles

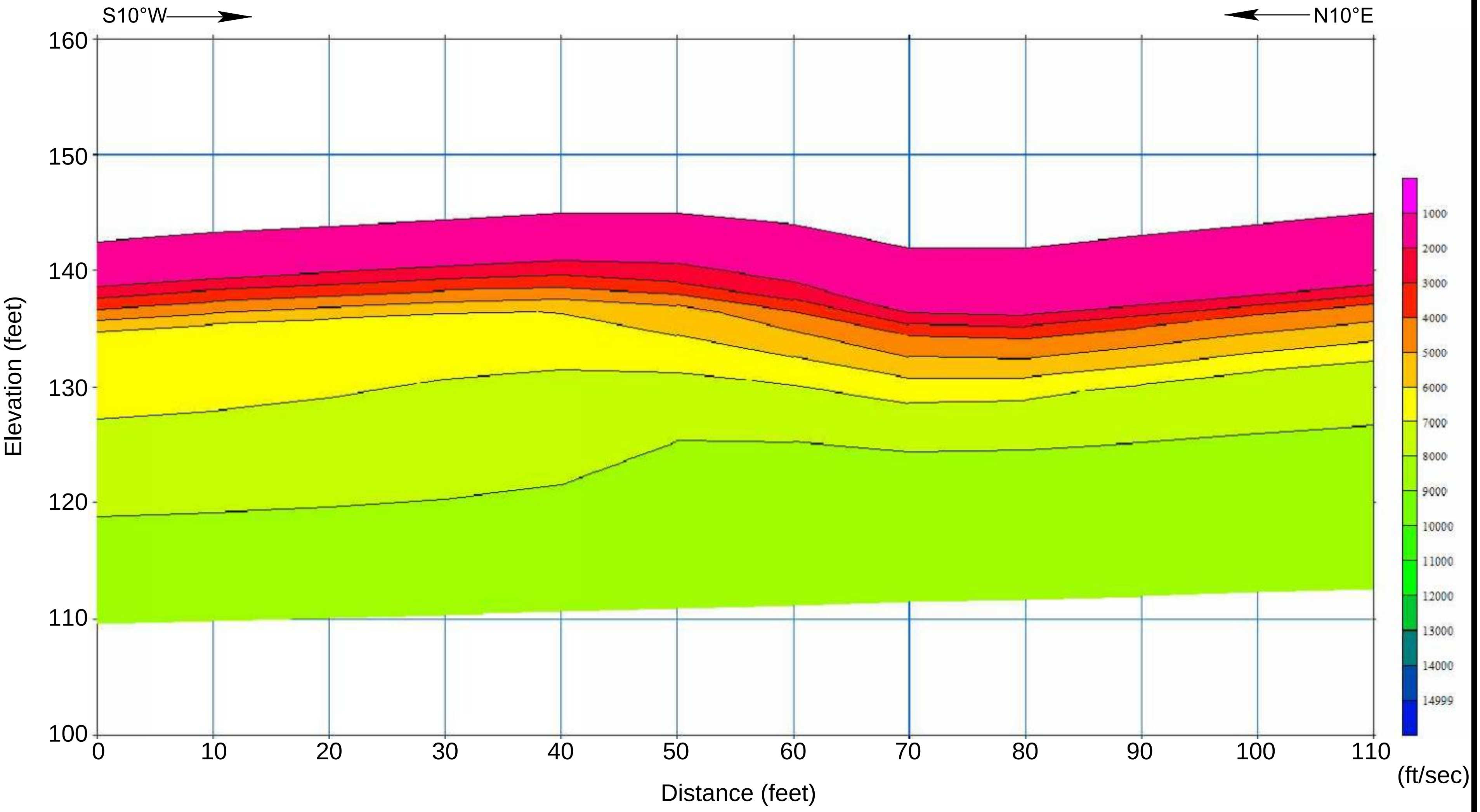
Seismic Refraction Methodology

A seismic refraction survey produces, records, and analyzes seismic waves to estimate the seismic velocity of subsurface materials. In general, we derive the seismic velocity of the subsurface from the travel time of compressional wave (P-wave) energy over the distance from the source to recording devices. An impulsive source generates P-wave energy at the surface. The P-wave energy propagates into the subsurface and is refracted along subsurface interfaces (likely layers) representing an increase in velocity. The P-wave energy returns to the surface where an array of geophones detects the waves, and a seismograph records them. We analyze this data to produce theoretical depth, thickness, and seismic velocity of the subsurface layers. We correlate the seismic velocity of the subsurface materials to soil and rock types, and rock weathering and competency.

Each seismic line consists of 5 shot points distributed along a linear array of 12 geophones, with a multi-channel receiver (seismograph) located at one end of the array to collect the data. We placed geophones at intervals of 10 feet (5 feet at one location) along the array. We generated compressional wave energy (P-waves) at each shot point using multiple impacts with a 20-pound sledge hammer striking a steel plate on the ground surface. We used a *Geometrics Geode* seismograph to detect, digitize, and record the P-waves.

Rob Pickard, C.E.G. led the field work and monitored the data acquisition. Seismic lines are located by GPS and referencing features shown on the project plan (locations are not surveyed).

We analyzed our data using Geometric, Inc.'s *SeisImager* software. The ground profile elevations at each line location are based on the topography shown on the Site Map (Figure 2).



blackburn consulting

11521 Blocker Drive, Ste 110
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Phone: (530) 887-1494
Fax: (530) 887-1495
www.blackburnconsulting.com

SR1 VELOCITY PROFILE

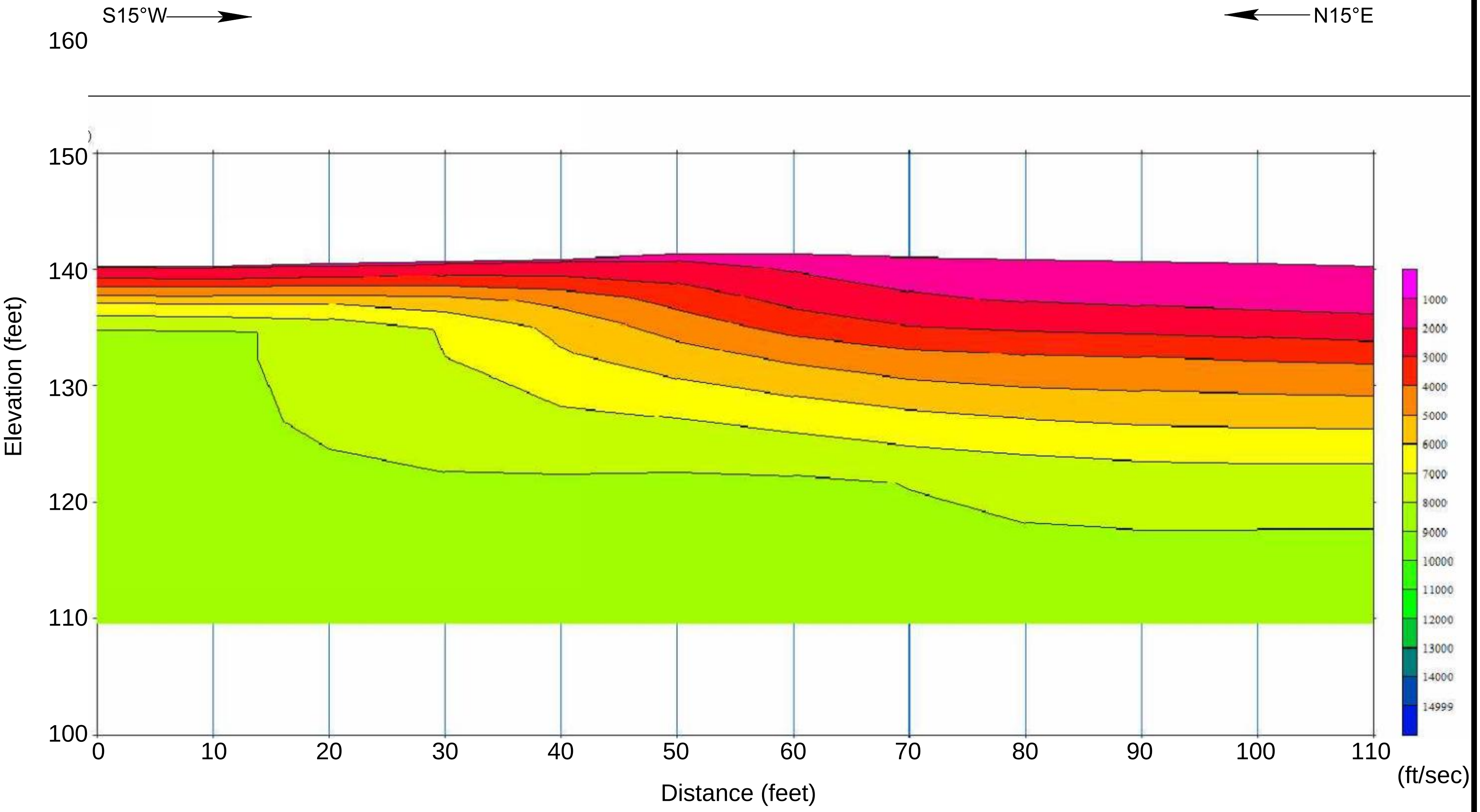
Shadowbrook Pump Station
Roseville, California

File No. 2794.x

July 2015

Appendix B

7/20/2015 2794.x AppC Shadowbrook Pump Station.dwg



7/20/2015 2794.x AppC Shadowbrook Pump Station.dwg

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SR2 VELOCITY PROFILE

Shadowbrook Pump Station
Roseville, California

File No. 2794.x

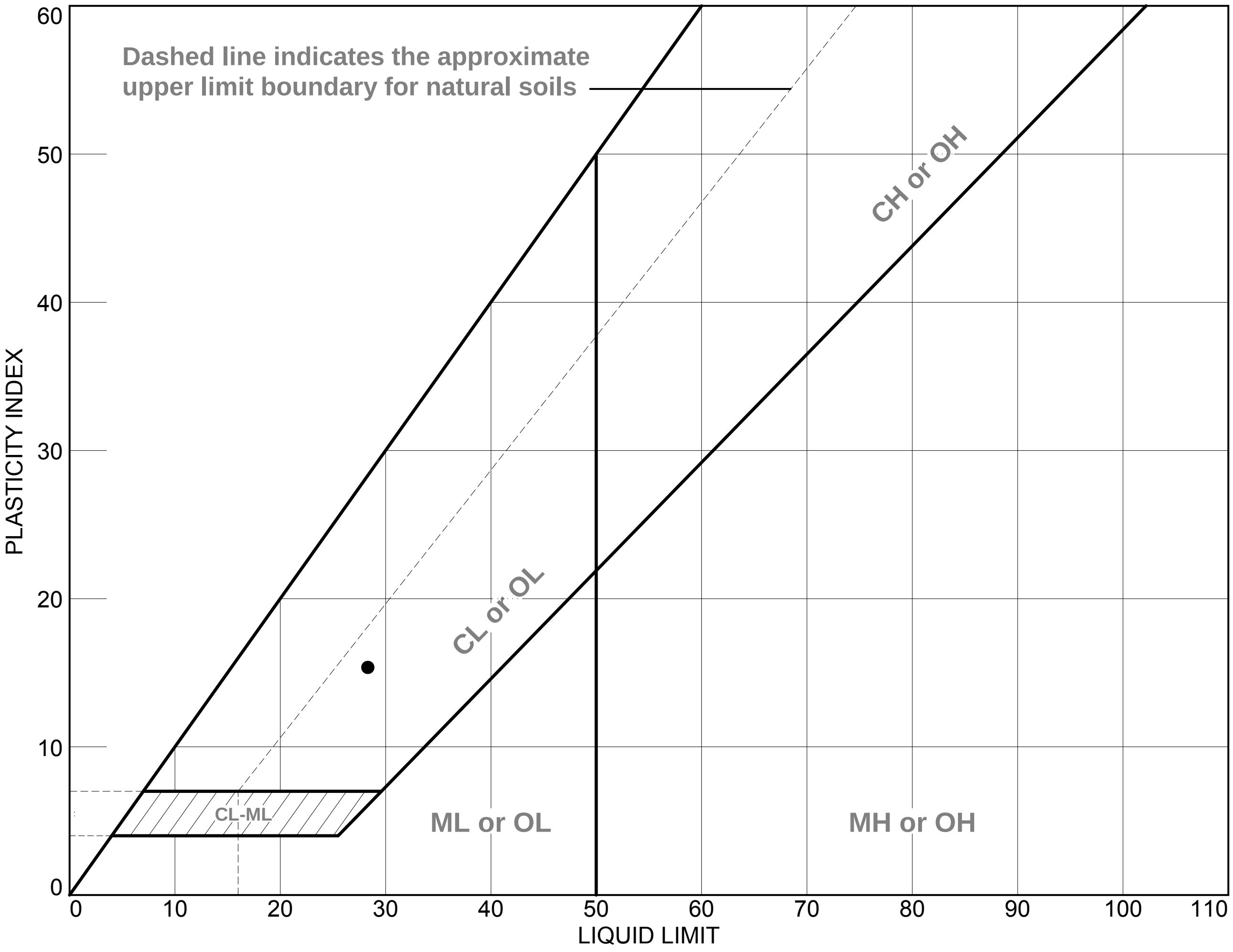
July 2015

Appendix B

APPENDIX C

Laboratory Test Results

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B2	2c	6.0-6.5'		13.1	28.4	15.3	CL

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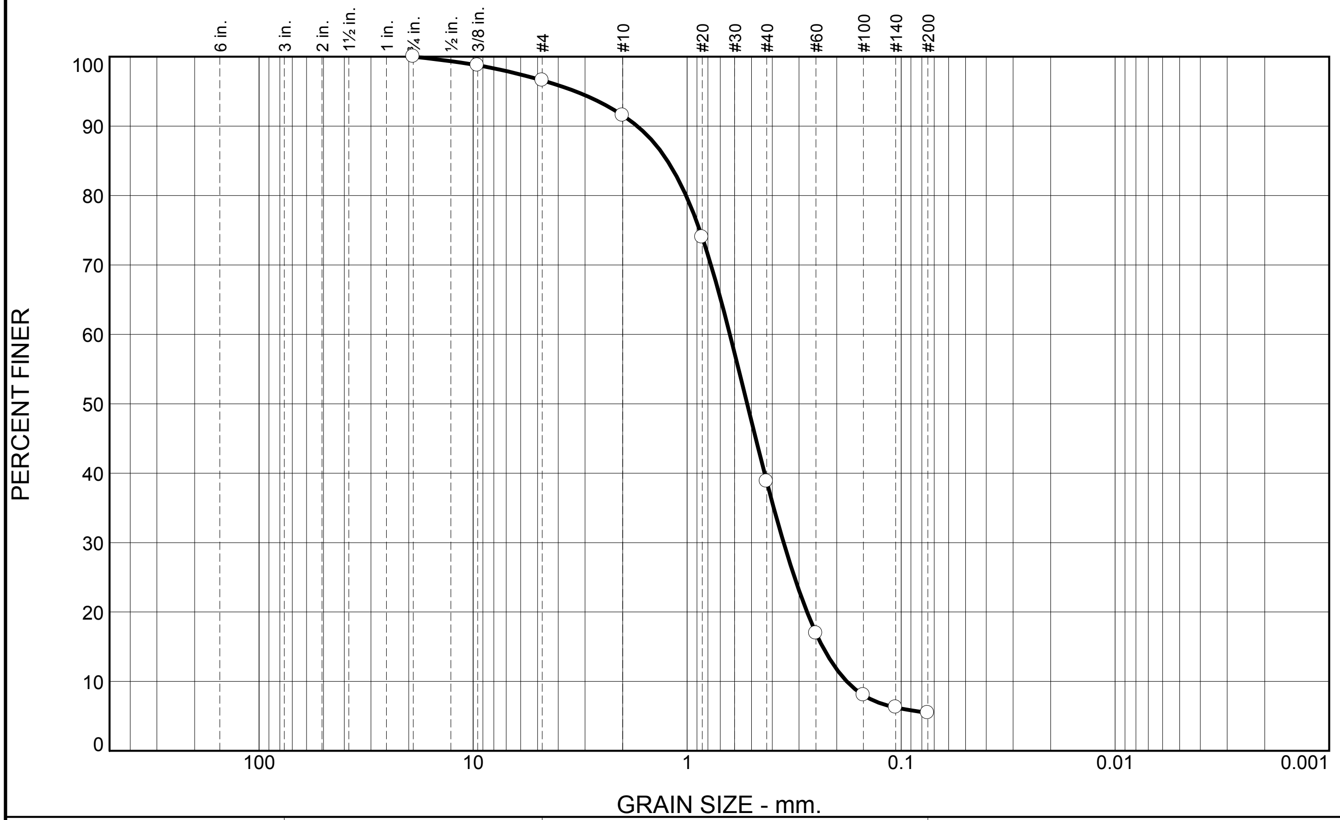
W. Sacramento, CA

Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

Project No.: 2794.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	3	5	53	34	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100		
3/8"	99		
#4	97		
#10	92		
#20	74		
#40	39		
#60	17		
#100	8		
#140	6		
#200	5.5		

* (no specification provided)

Material Description

Poorly-graded SAND with SILT, yellowish brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.7117 D_{85}= 1.2356 D_{60}= 0.6313
D_{50}= 0.5242 D_{30}= 0.3540 D_{15}= 0.2326
D_{10}= 0.1795 C_u= 3.52 C_c= 1.11

Classification

USCS= AASHTO=

Remarks

Source of Sample: B2 **Depth:** 10.5-11.0'
Sample Number: 3b

Date: 4/16/2015

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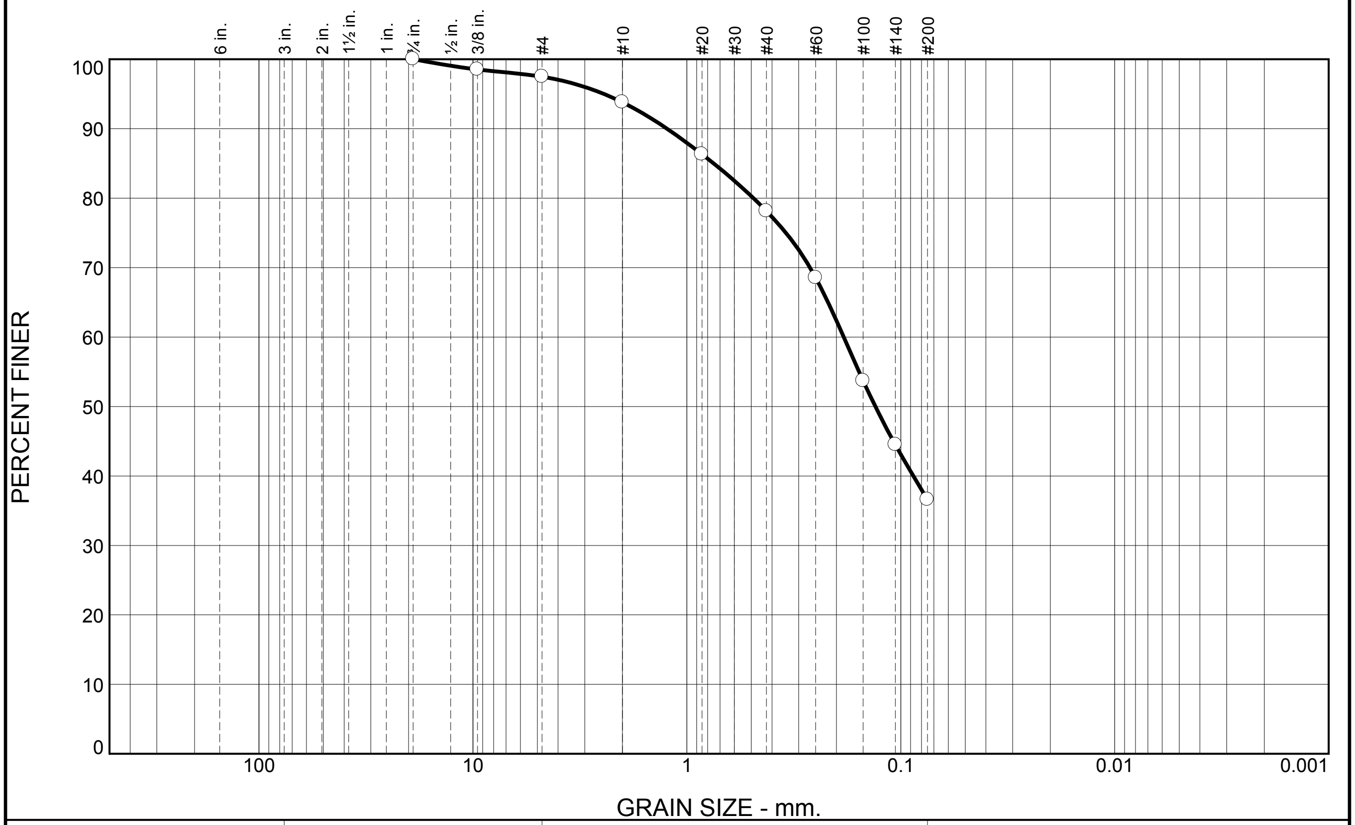
Client: Hatch Mott MacDonald
Project: Shadowbrook Lift Station
Project No: 2794.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	3	3	16	41	37	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100		
3/8"	99		
#4	97		
#10	94		
#20	86		
#40	78		
#60	69		
#100	54		
#140	44		
#200	37		

* (no specification provided)

Material Description

SILTY SAND, dark yellowish brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.2400 D_{85}= 0.7504 D_{60}= 0.1849
D_{50}= 0.1315 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

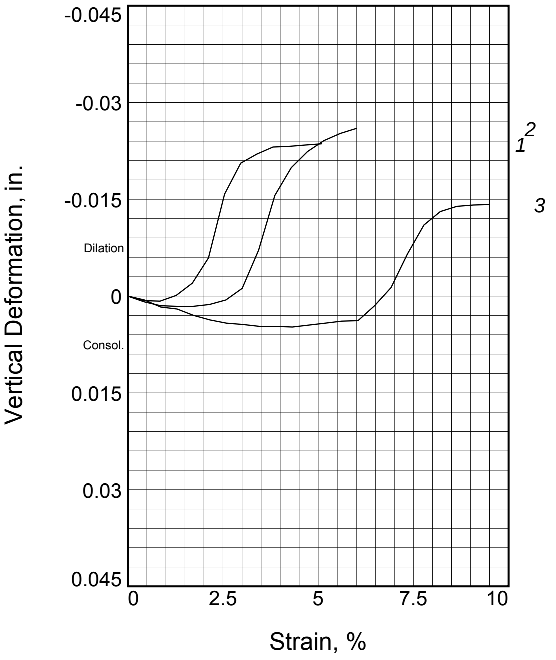
Source of Sample: B4 **Depth:** 11.0-11.5'
Sample Number: 3c

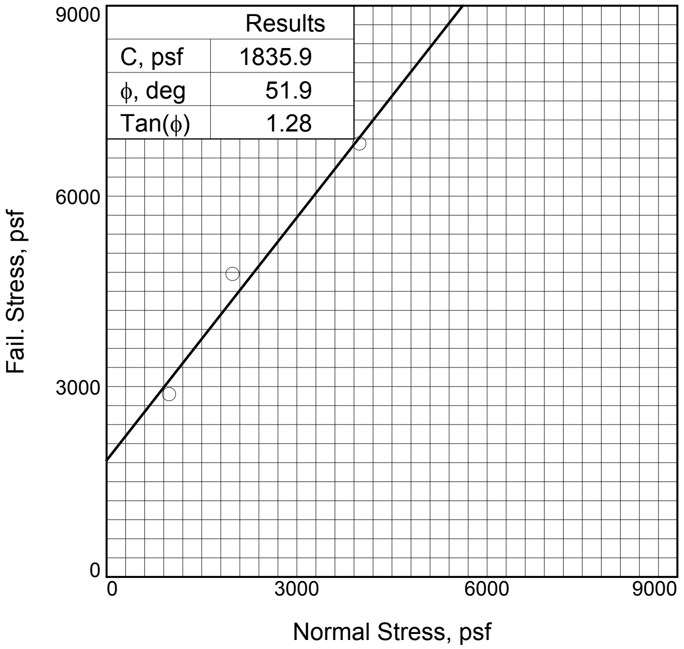
Date: 4/15/2015

Blackburn Consulting

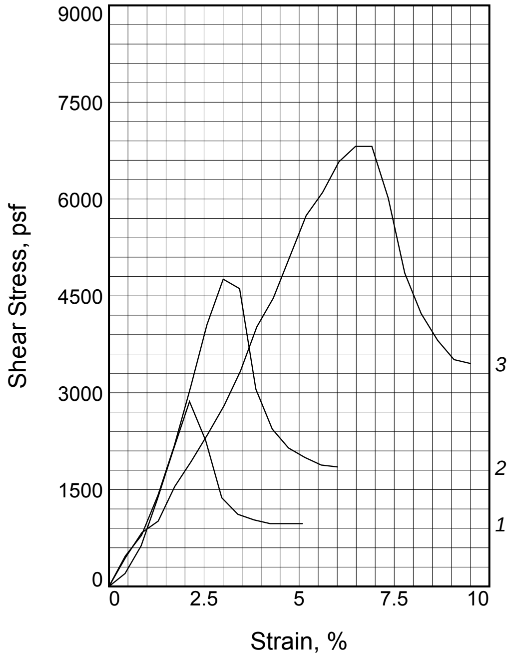
W. Sacramento, CA

Client: Hatch Mott MacDonald
Project: Shadowbrook Lift Station
Project No: 2794.X **Figure**





	Results
C, psf	1835.9
ϕ, deg	51.9
Tan(ϕ)	1.28



Sample No.		1	2	3
Initial	Water Content, %	25.6	23.5	26.6
	Dry Density, pcf	83.9	88.7	82.3
	Saturation, %	68.5	70.5	68.6
	Void Ratio	1.0083	0.9003	1.0481
	Diameter, in.	2.360	2.330	2.315
	Height, in.	0.965	0.968	0.970
At Test	Water Content, %	29.5	28.6	33.4
	Dry Density, pcf	84.6	89.8	84.3
	Saturation, %	80.1	88.2	90.4
	Void Ratio	0.9929	0.8761	0.9994
	Diameter, in.	2.360	2.330	2.315
	Height, in.	0.958	0.956	0.947
Normal Stress, psf		1000.0	2000.0	4000.0
Fail. Stress, psf		2864.0	4759.9	6815.9
Strain, %		2.1	3.0	6.5
Ult. Stress, psf				
Strain, %				
Strain rate, in./min.		0.004	0.004	0.004

Sample Type: Rock Core

Description: weakly cemented SANDSTONE, gray

Assumed Specific Gravity= 2.70

Remarks:

Figure ________

Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

Source of Sample: B1 **Depth:** 33.3'-33.6'

Sample Number: Run 7

Proj. No.: 2794.X **Date Sampled:** 4/2/2015

DIRECT SHEAR TEST REPORT

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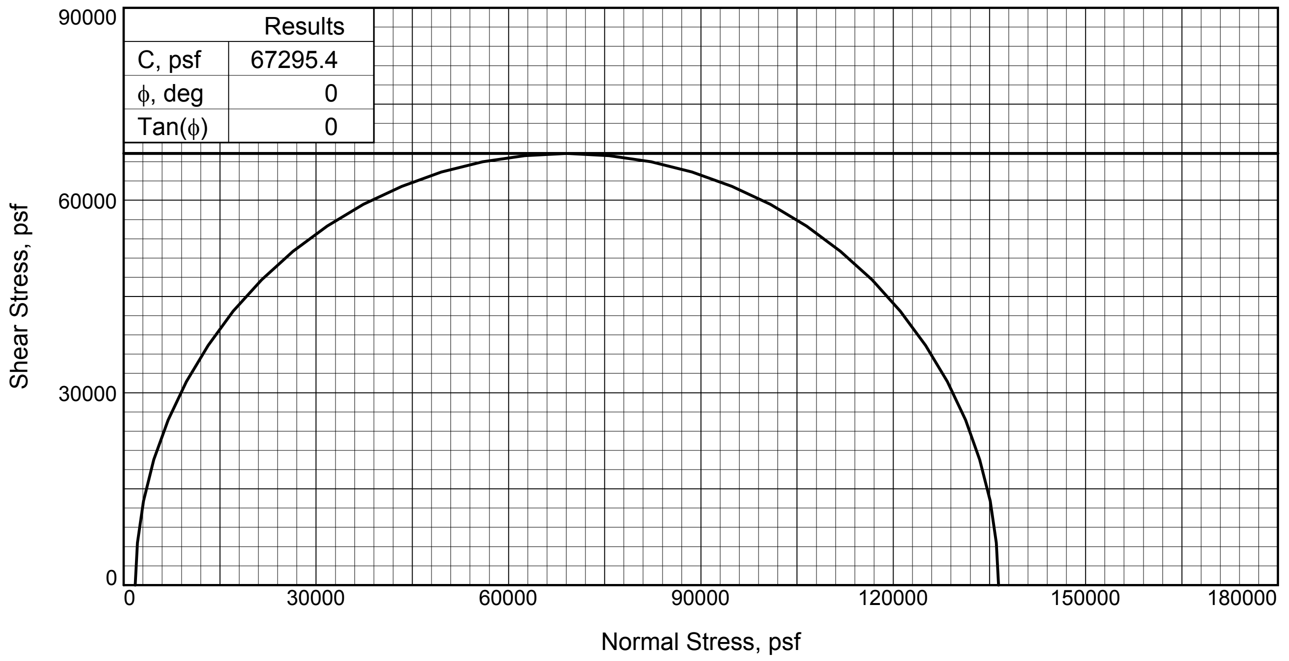
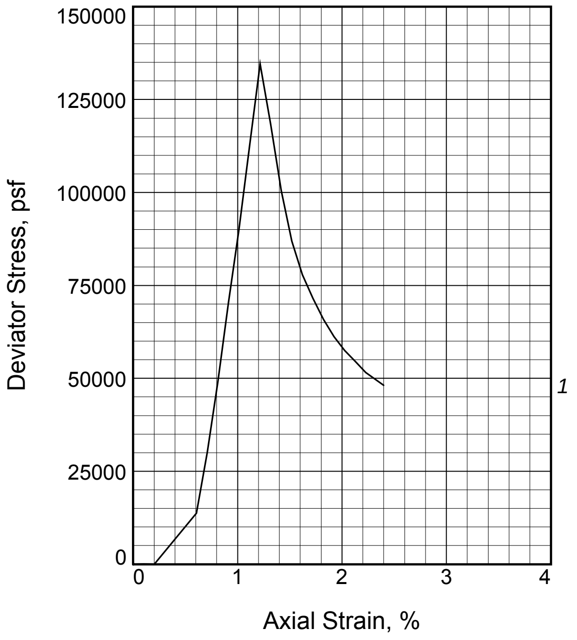


	Results
C, psf	67295.4
ϕ, deg	0
Tan(ϕ)	0



	Sample No.	1
Initial	Water Content, %	16.5
	Dry Density, pcf	106.1
	Saturation, %	75.5
	Void Ratio	0.5885
	Diameter, in.	2.393
	Height, in.	5.075
At Test	Water Content, %	16.2
	Dry Density, pcf	106.1
	Saturation, %	74.5
	Void Ratio	0.5885
	Diameter, in.	2.393
	Height, in.	5.075
	Strain rate, in./min.	0.014
	Back Pressure, psf	0.0
	Cell Pressure, psf	1800.0
	Fail. Stress, psf	134590.8
	Strain, %	1.2
	Ult. Stress, psf	
	Strain, %	
	$\pm_1$ Failure, psf	136390.8
	$\pm_3$ Failure, psf	1800.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed Core Sample

Description: Siltstone, brown

Assumed Specific Gravity= 2.70

Remarks:

Figure ________

Client: Hatch Mott MacDonald

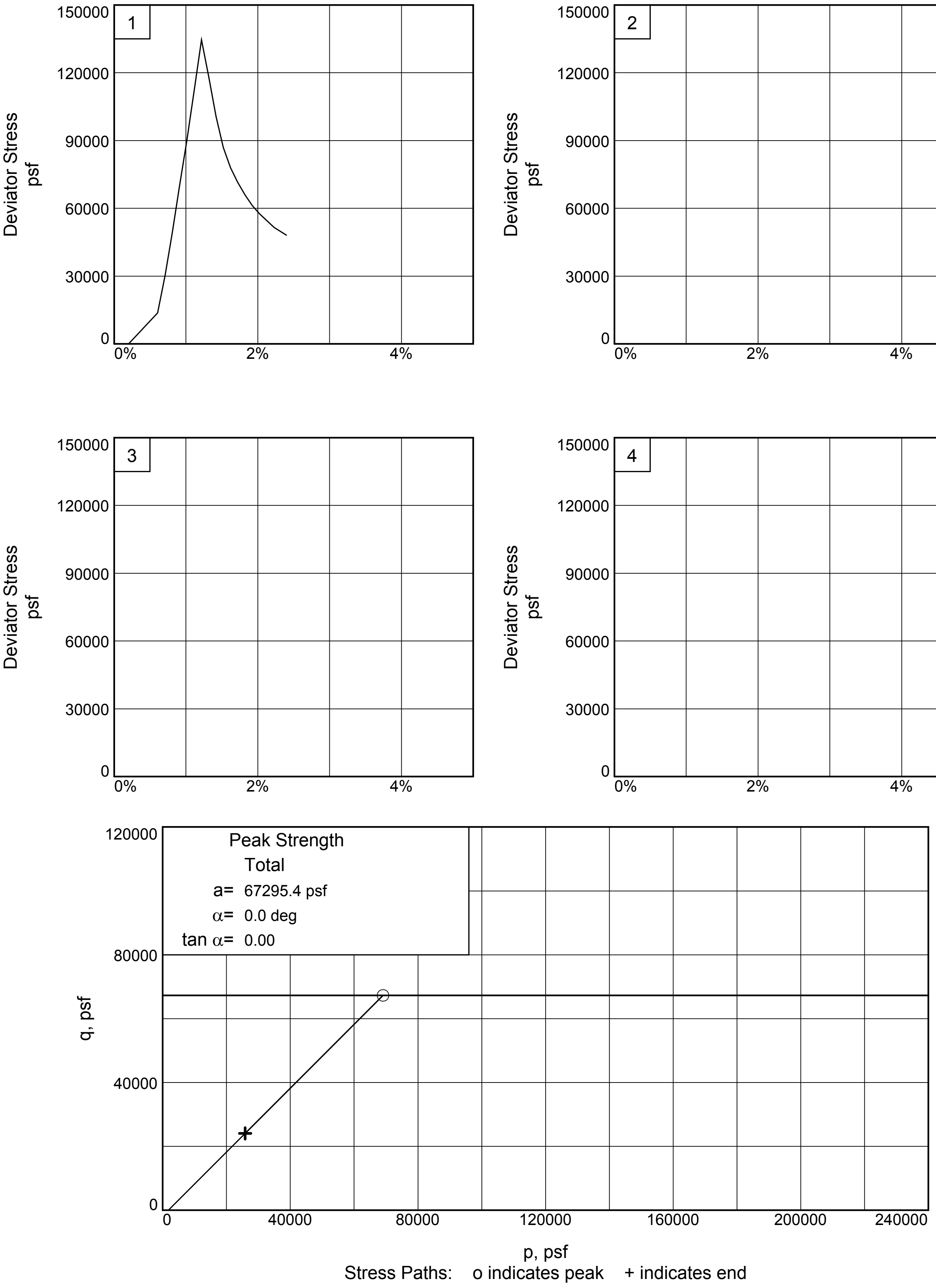
Project: Shadowbrook Lift Station

Source of Sample: B1 **Depth:** 16.3-17.2'

Sample Number: Run 3

Proj. No.: 2794.X **Date Sampled:** 4/2/2015

TRIAXIAL SHEAR TEST REPORT
Blackburn Consulting
W. Sacramento, CA



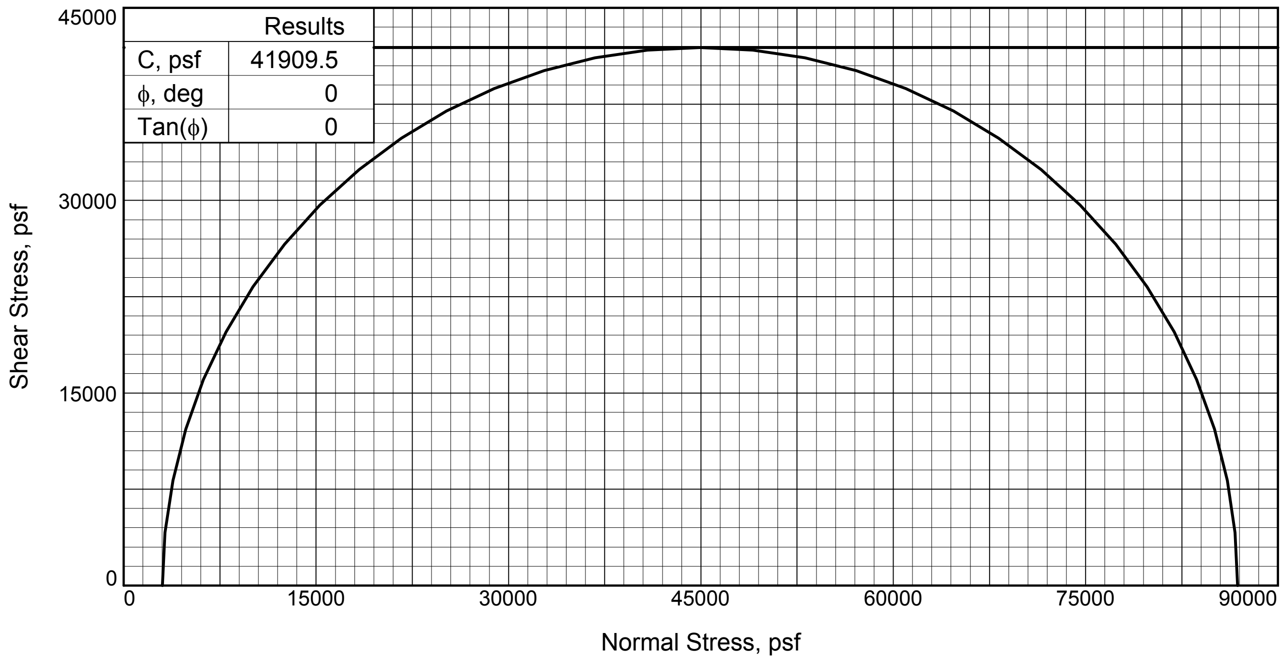
Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

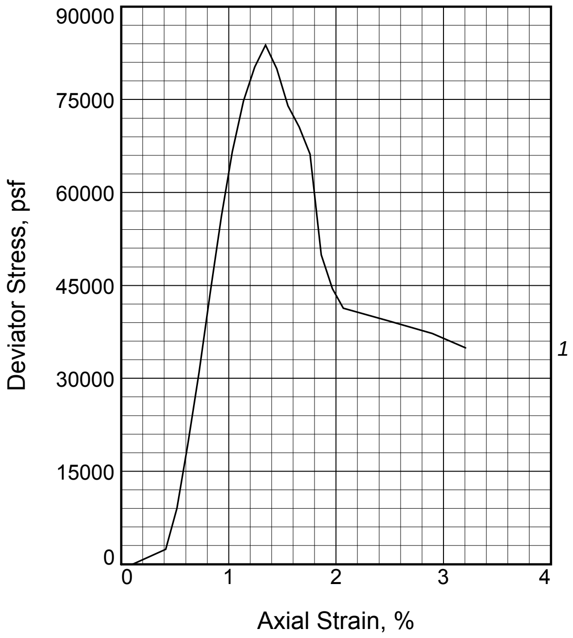
Source of Sample: B1 **Depth:** 16.3-17.2' **Sample Number:** Run 3

Project No.: 2794.X **Figure** ________

Blackburn Consulting



	Results
C, psf	41909.5
ϕ, deg	0
Tan(ϕ)	0



Sample No.		1
Initial	Water Content, %	24.3
	Dry Density, pcf	94.5
	Saturation, %	83.8
	Void Ratio	0.7830
	Diameter, in.	2.395
	Height, in.	4.972
At Test	Water Content, %	23.9
	Dry Density, pcf	94.5
	Saturation, %	82.3
	Void Ratio	0.7830
	Diameter, in.	2.395
	Height, in.	4.972
Strain rate, in./min.		0.048
Back Pressure, psf		0.0
Cell Pressure, psf		3024.0
Fail. Stress, psf		83818.9
Strain, %		1.3
Ult. Stress, psf		
Strain, %		
$\pm_1$ Failure, psf		86842.9
$\pm_3$ Failure, psf		3024.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed Core Sample

Description: Siltstone, brown

Assumed Specific Gravity= 2.70

Remarks:

Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

Source of Sample: B1 **Depth:** 23.1-23.7'

Sample Number: Run 5

Proj. No.: 2794.X **Date Sampled:** 4/2/2015

TRIAXIAL SHEAR TEST REPORT

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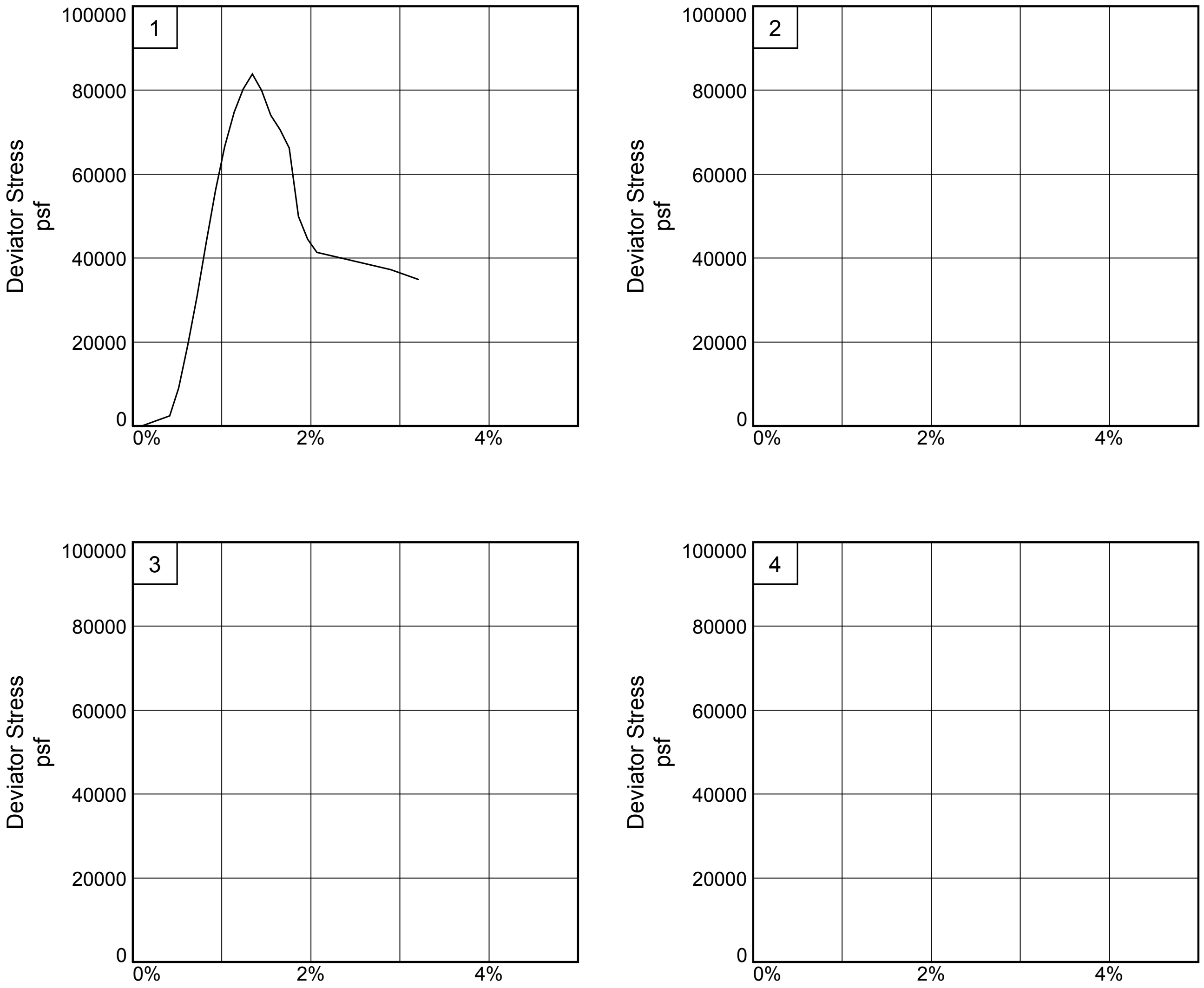
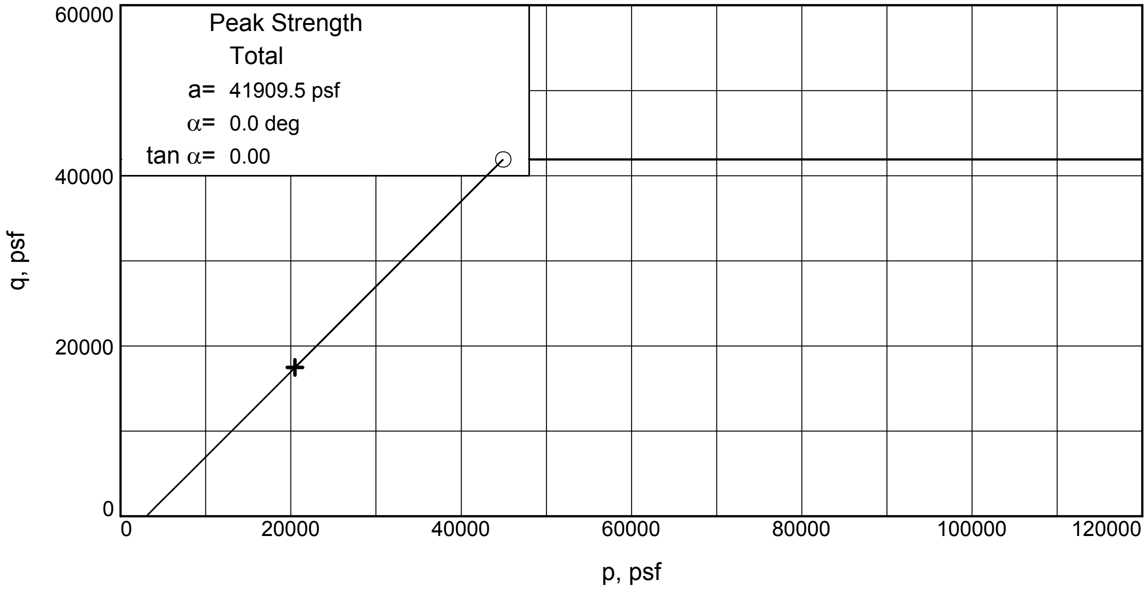
W. Sacramento, CA

Figure ________





Stress Paths: o indicates peak + indicates end

Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

Source of Sample: B1 **Depth:** 23.1-23.7' **Sample Number:** Run 5

Project No.: 2794.X **Figure** ________

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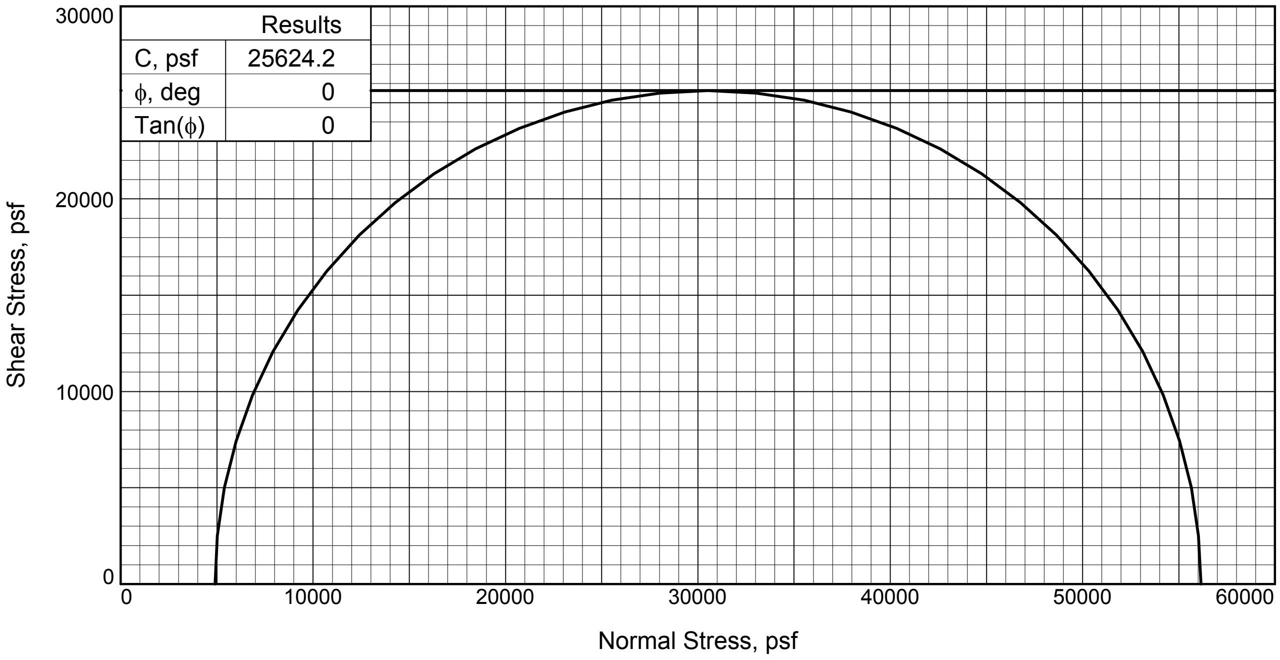
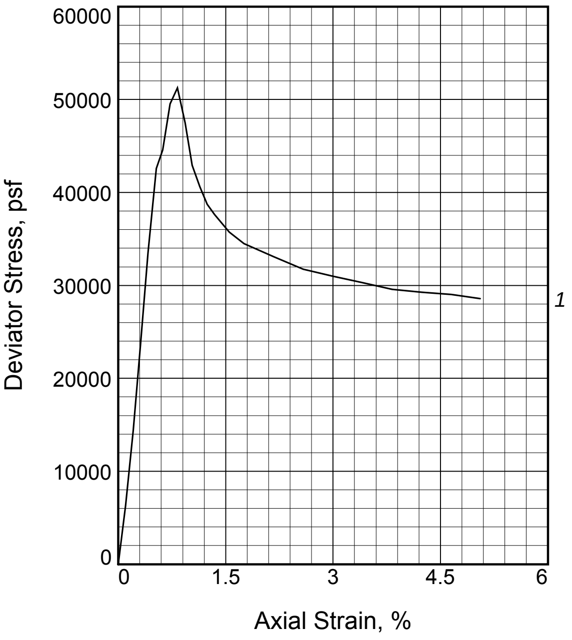


	Results
C, psf	25624.2
ϕ, deg	0
Tan(ϕ)	0



	Sample No.	1
Initial	Water Content, %	33.2
	Dry Density, pcf	84.2
	Saturation, %	89.4
	Void Ratio	1.0024
	Diameter, in.	2.420
	Height, in.	4.974
At Test	Water Content, %	32.8
	Dry Density, pcf	84.2
	Saturation, %	88.3
	Void Ratio	1.0024
	Diameter, in.	2.420
	Height, in.	4.974
	Strain rate, in./min.	0.049
	Back Pressure, psf	0.0
	Cell Pressure, psf	4896.0
	Fail. Stress, psf	51248.4
	Strain, %	0.8
	Ult. Stress, psf	
	Strain, %	
	$\pm_1$ Failure, psf	56144.4
	$\pm_3$ Failure, psf	4896.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed Core Sample

Description: Siltstone, strong brown

Assumed Specific Gravity= 2.70

Remarks:

Figure ________

Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

Source of Sample: B1 **Depth:** 38.5-39.0'

Sample Number: Run 8

Proj. No.: 2794.X **Date Sampled:** 4/2/2015

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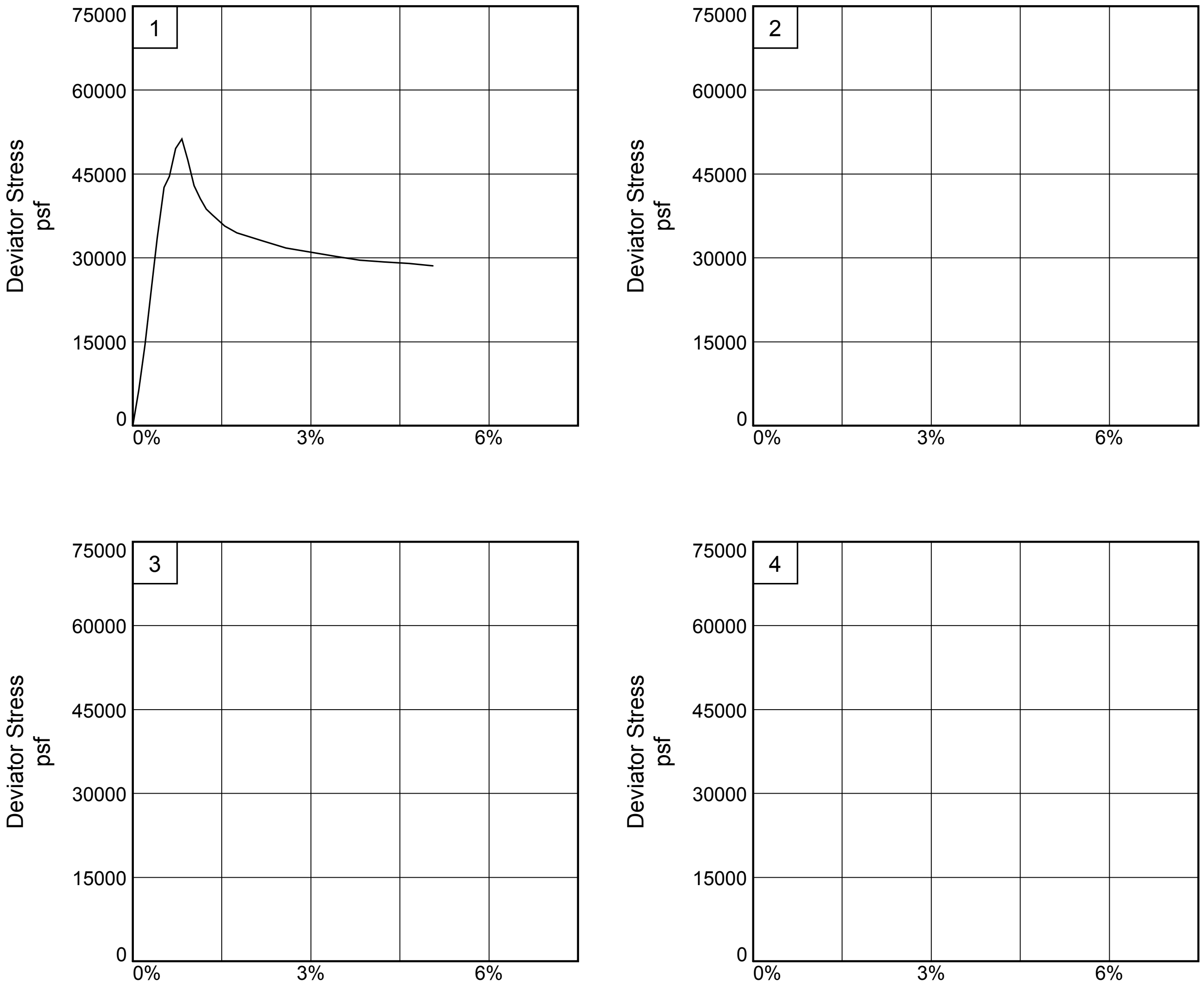
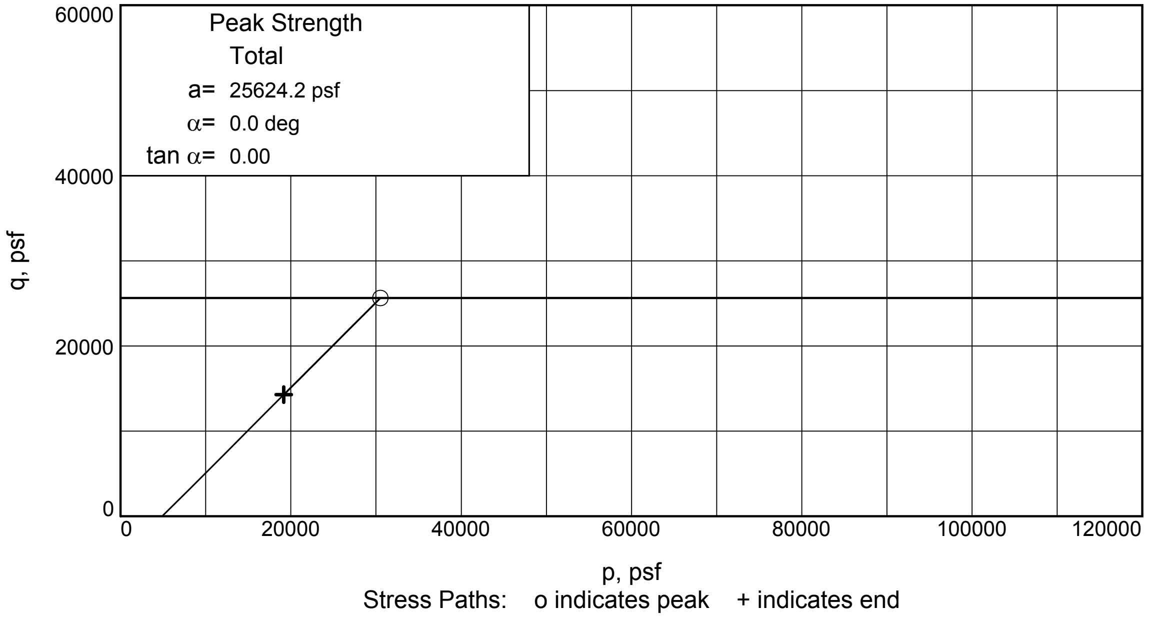




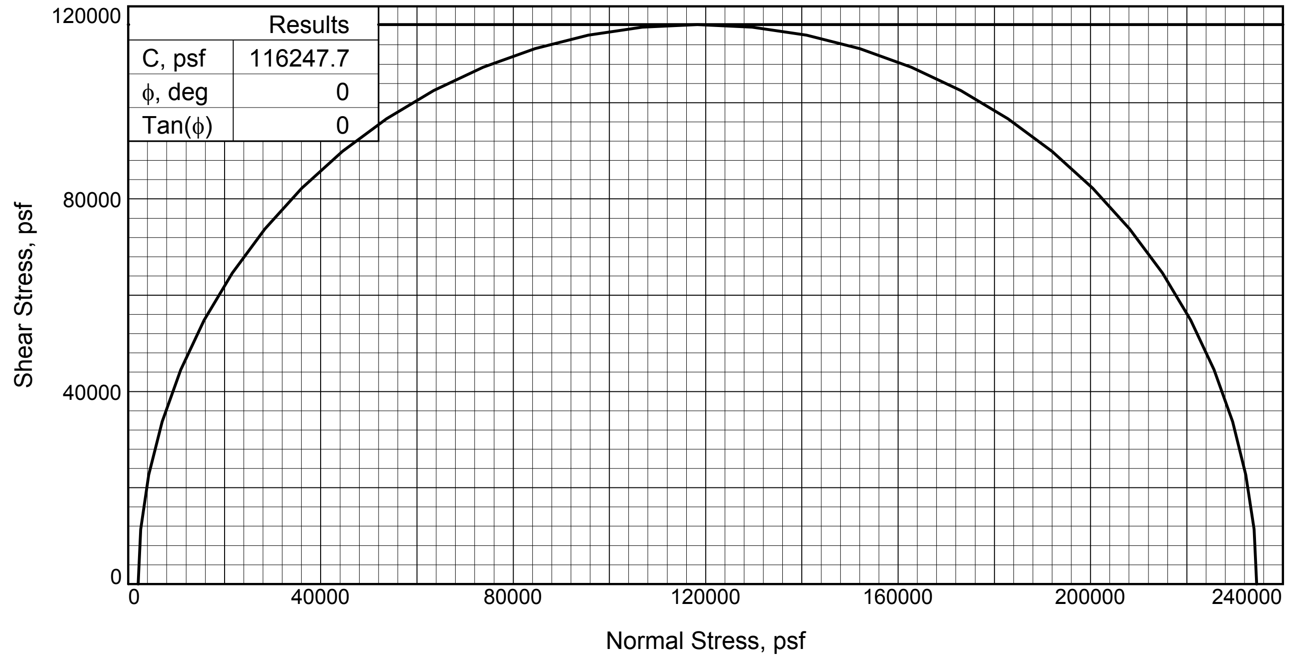
Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

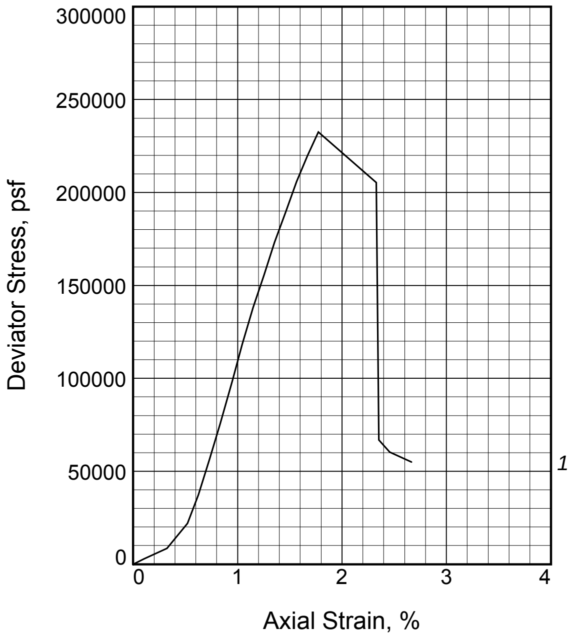
Source of Sample: B1 **Depth:** 38.5-39.0' **Sample Number:** Run 8

Project No.: 2794.X **Figure** ________

Blackburn Consulting



Results	
C, psf	116247.7
ϕ, deg	0
Tan(ϕ)	0



Sample No.		1
Initial	Water Content, %	17.6
	Dry Density, pcf	109.7
	Saturation, %	88.8
	Void Ratio	0.5360
	Diameter, in.	2.393
	Height, in.	4.929
At Test	Water Content, %	17.4
	Dry Density, pcf	109.7
	Saturation, %	87.8
	Void Ratio	0.5360
	Diameter, in.	2.393
	Height, in.	4.929
Strain rate, in./min.		0.045
Back Pressure, psf		0.0
Cell Pressure, psf		2016.0
Fail. Stress, psf		232495.5
Strain, %		1.8
Ult. Stress, psf		
Strain, %		
$\pm_1$ Failure, psf		234511.5
$\pm_3$ Failure, psf		2016.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed Core Sample

Description: Siltstone, strong brown

Assumed Specific Gravity= 2.70

Remarks:

Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

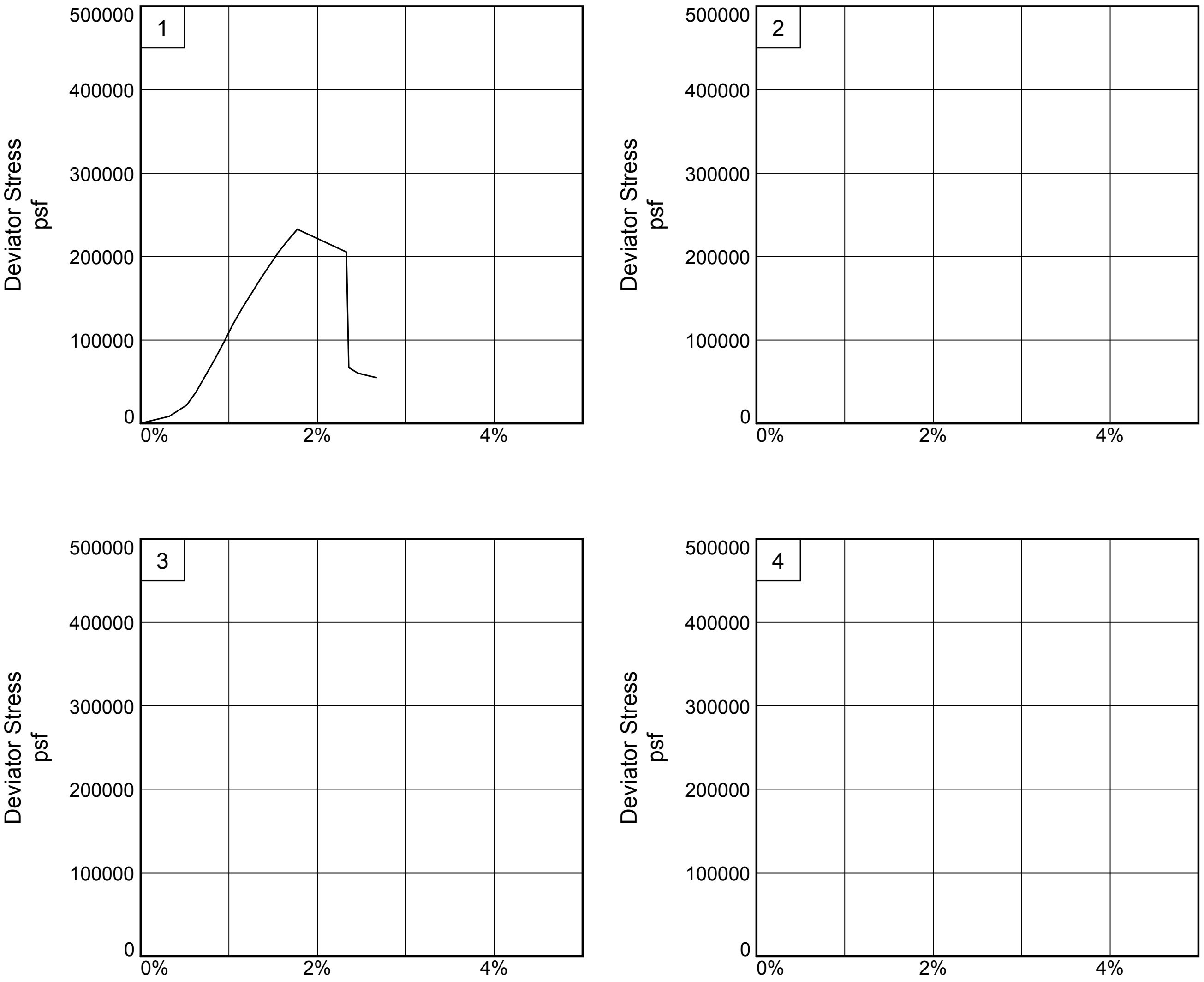
Source of Sample: B2 **Depth:** 20.85-21.35'

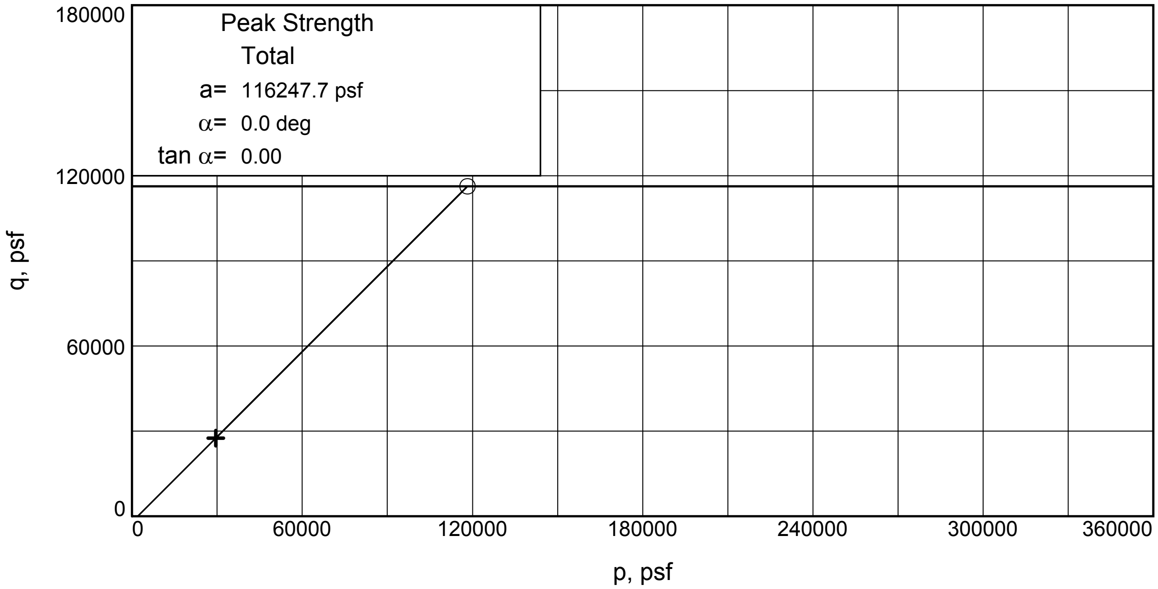
Sample Number: Run 2

Proj. No.: 2794.X **Date Sampled:** 4/2/2015

TRIAXIAL SHEAR TEST REPORT
Blackburn Consulting
W. Sacramento, CA

Figure ________





Stress Paths: o indicates peak + indicates end

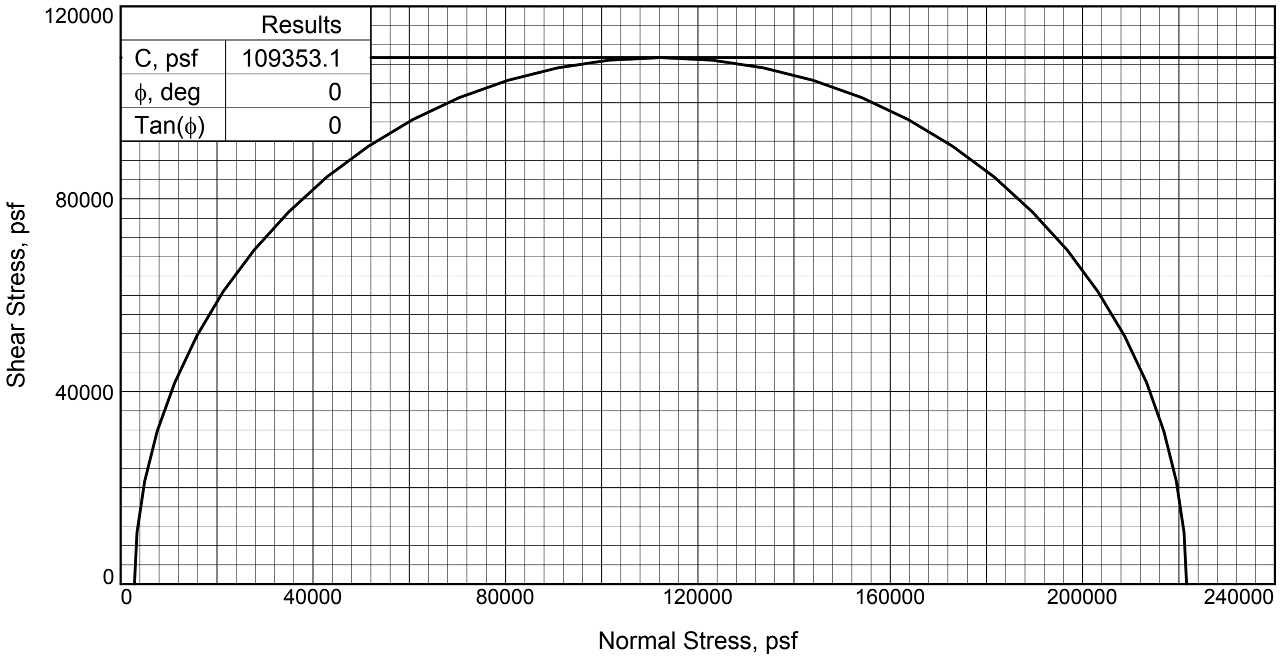
Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

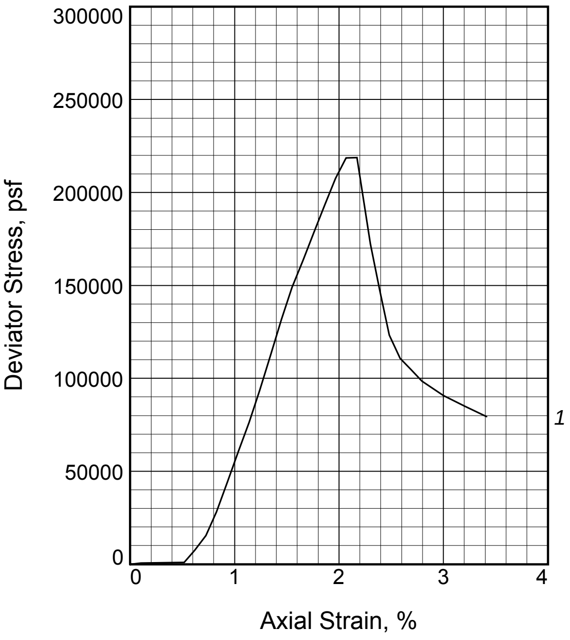
Source of Sample: B2 **Depth:** 20.85-21.35' **Sample Number:** Run 2

Project No.: 2794.X **Figure** ________

Blackburn Consulting



	Results
C, psf	109353.1
ϕ, deg	0
Tan(ϕ)	0



Sample No.		1
Initial	Water Content, %	3.1
	Dry Density, pcf	118.9
	Saturation, %	19.9
	Void Ratio	0.4179
	Diameter, in.	2.387
	Height, in.	4.970
At Test	Water Content, %	3.0
	Dry Density, pcf	118.9
	Saturation, %	19.3
	Void Ratio	0.4179
	Diameter, in.	2.387
	Height, in.	4.970
Strain rate, in./min.		0.014
Back Pressure, psf		0.0
Cell Pressure, psf		2880.0
Fail. Stress, psf		218706.2
Strain, %		2.2
Ult. Stress, psf		
Strain, %		
$\pm_1$ Failure, psf		221586.2
$\pm_3$ Failure, psf		2880.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed Core Sample

Description: Rock, pinkish white

Assumed Specific Gravity= 2.70

Remarks:

Figure ________

Client: Hatch Mott MacDonald

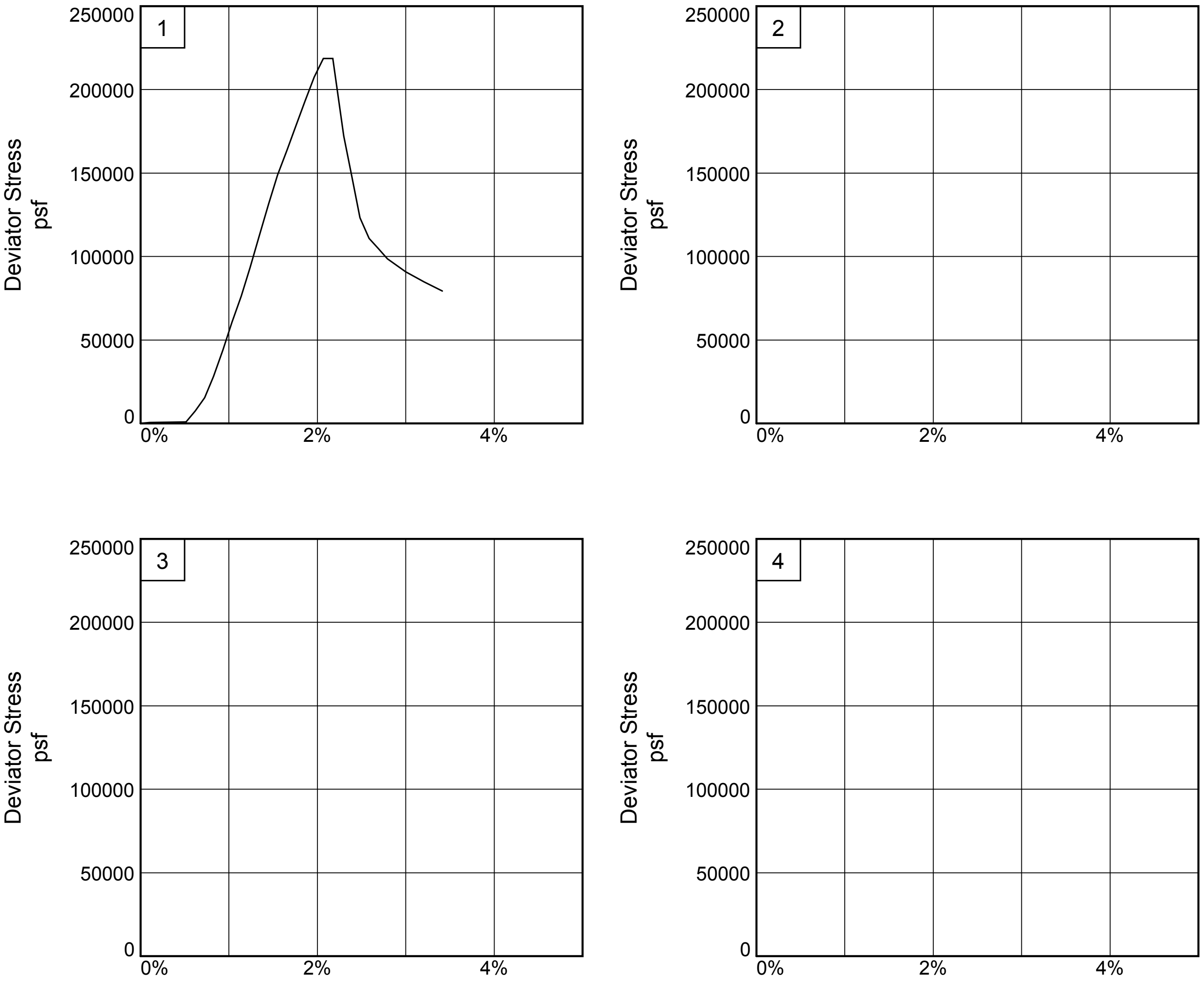
Project: Shadowbrook Lift Station

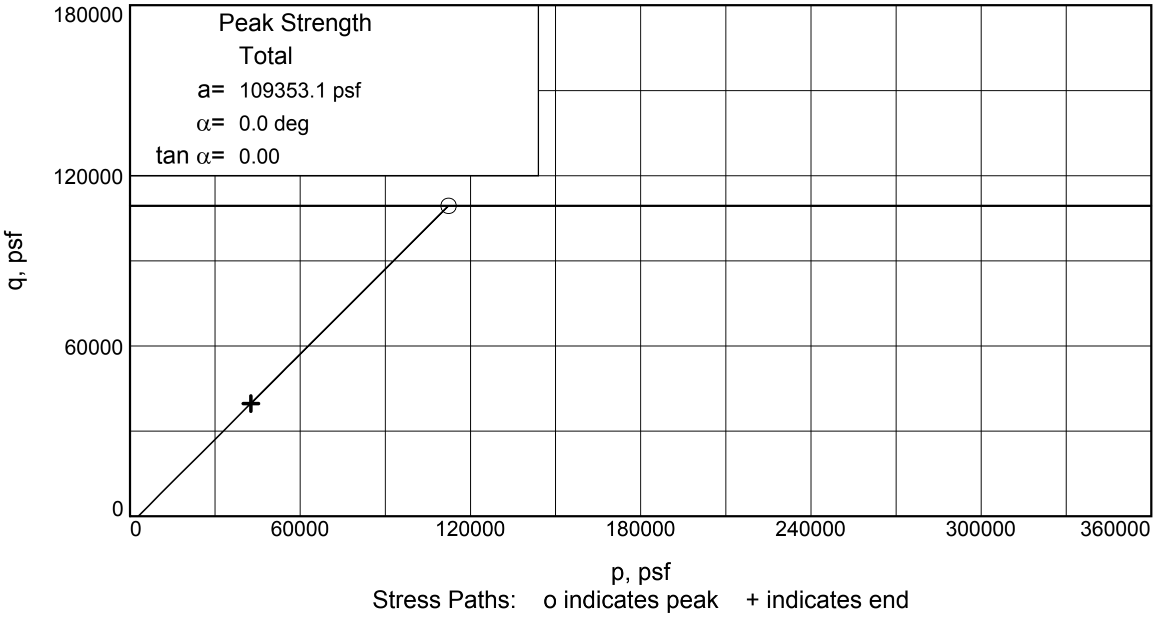
Source of Sample: B2 **Depth:** 25.8-26.4'

Sample Number: Run 3

Proj. No.: 2794.X **Date Sampled:** 4/2/2015

TRIAXIAL SHEAR TEST REPORT
Blackburn Consulting
W. Sacramento, CA





Peak Strength
Total
a= 109353.1 psf
α= 0.0 deg
tan α= 0.00

Stress Paths: o indicates peak + indicates end

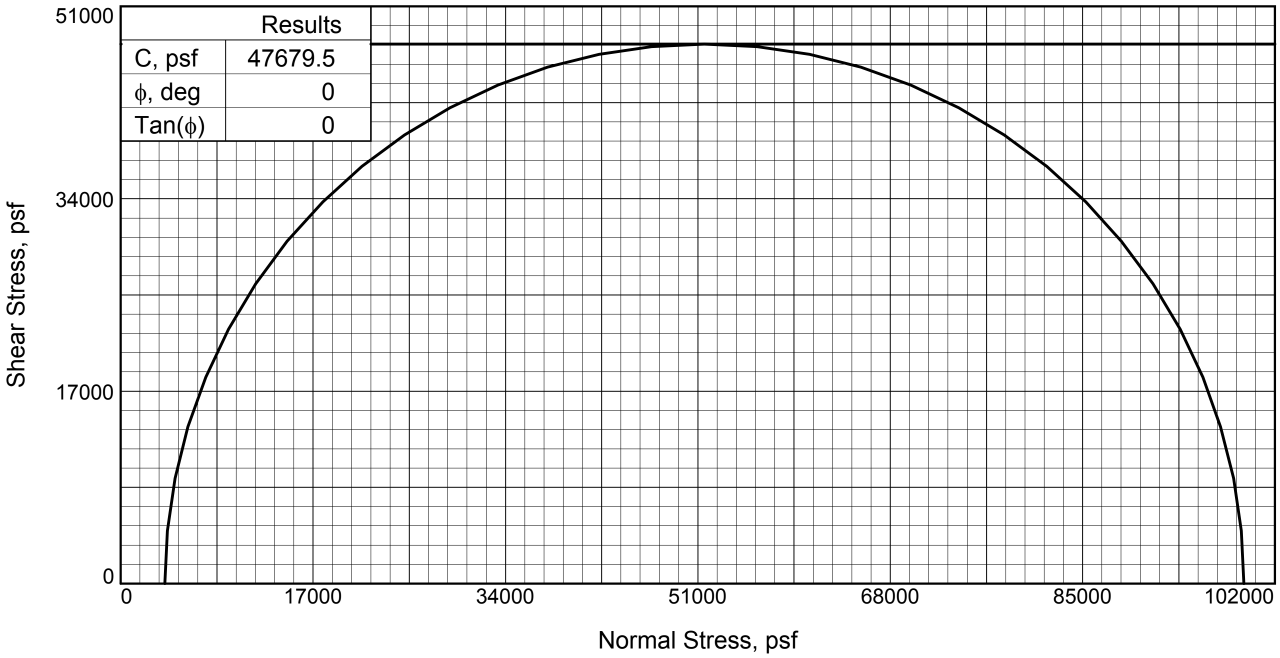
Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

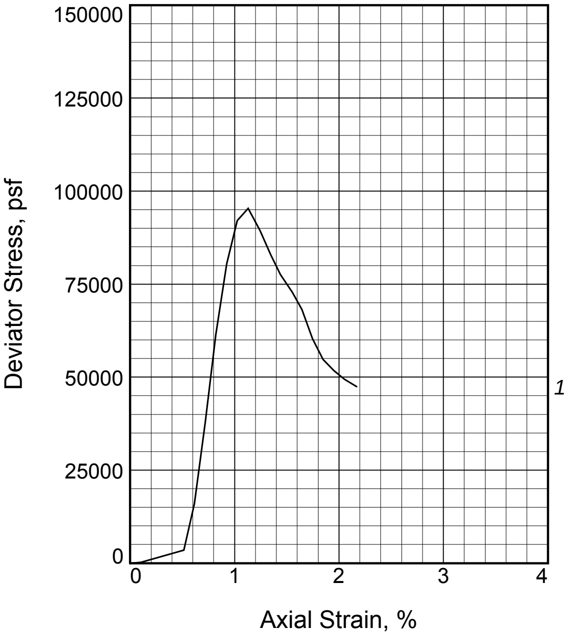
Source of Sample: B2 **Depth:** 25.8-26.4' **Sample Number:** Run 3

Project No.: 2794.X **Figure** ________

Blackburn Consulting



	Results
C, psf	47679.5
ϕ, deg	0
Tan(ϕ)	0



Sample No.		1
Initial	Water Content, %	18.1
	Dry Density, pcf	102.7
	Saturation, %	76.4
	Void Ratio	0.6417
	Diameter, in.	2.398
	Height, in.	5.006
At Test	Water Content, %	18.0
	Dry Density, pcf	102.7
	Saturation, %	75.8
	Void Ratio	0.6417
	Diameter, in.	2.398
	Height, in.	5.006
Strain rate, in./min.		0.046
Back Pressure, psf		0.0
Cell Pressure, psf		3888.0
Fail. Stress, psf		95358.9
Strain, %		1.1
Ult. Stress, psf		
Strain, %		
$\pm_1$ Failure, psf		99246.9
$\pm_3$ Failure, psf		3888.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed Core Sample

Description: Siltstone, strong brown

Assumed Specific Gravity= 2.70

Remarks:

Figure _______

Client: Hatch Mott MacDonald

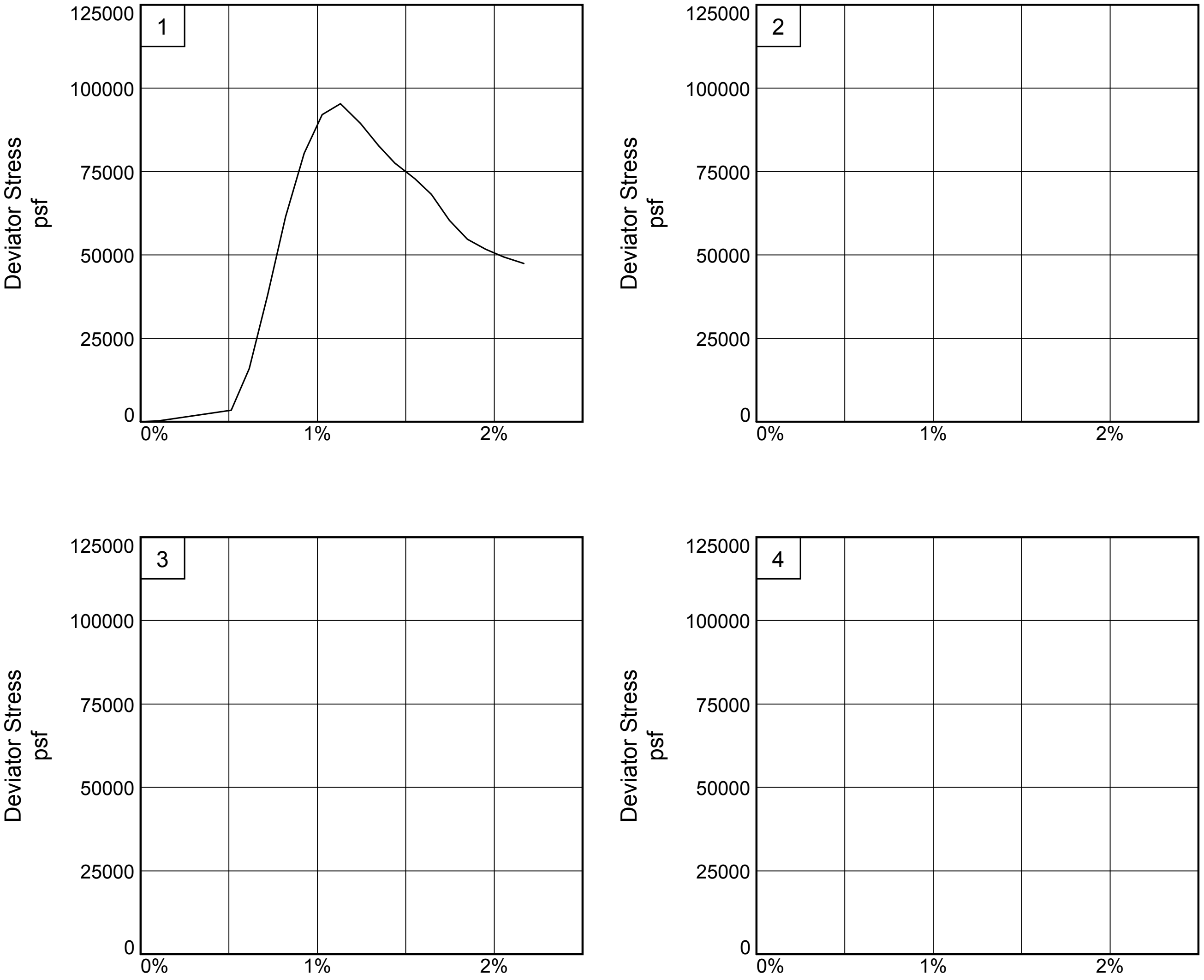
Project: Shadowbrook Lift Station

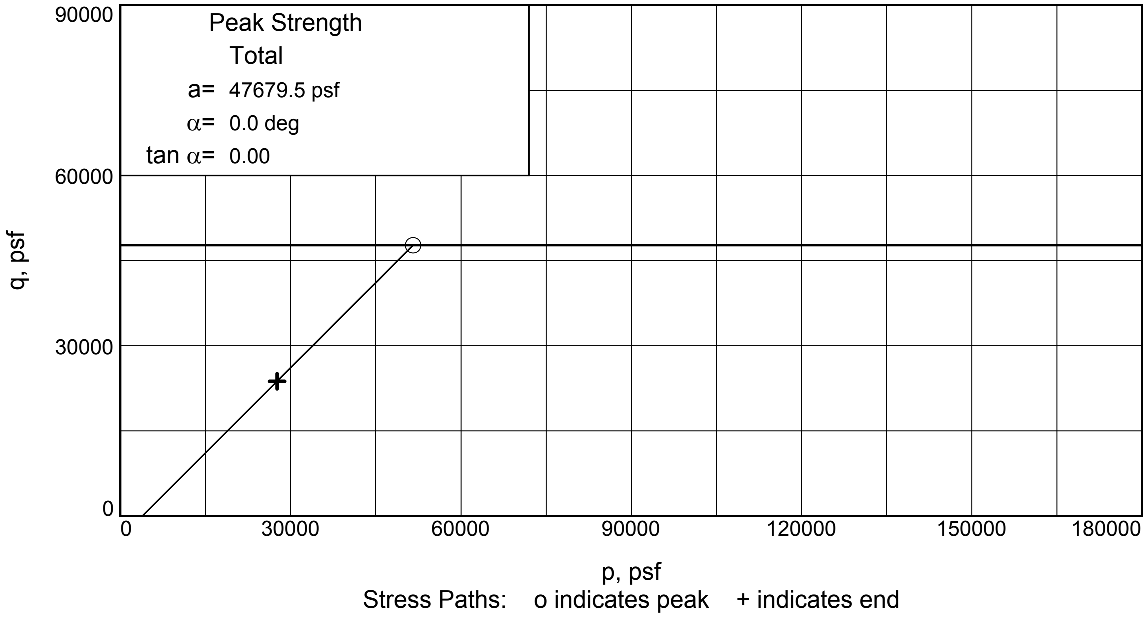
Source of Sample: B2 **Depth:** 32.1-32.8'

Sample Number: Run 5

Proj. No.: 2794.X **Date Sampled:** 4/2/2015

TRIAXIAL SHEAR TEST REPORT
Blackburn Consulting
W. Sacramento, CA





Client: Hatch Mott MacDonald

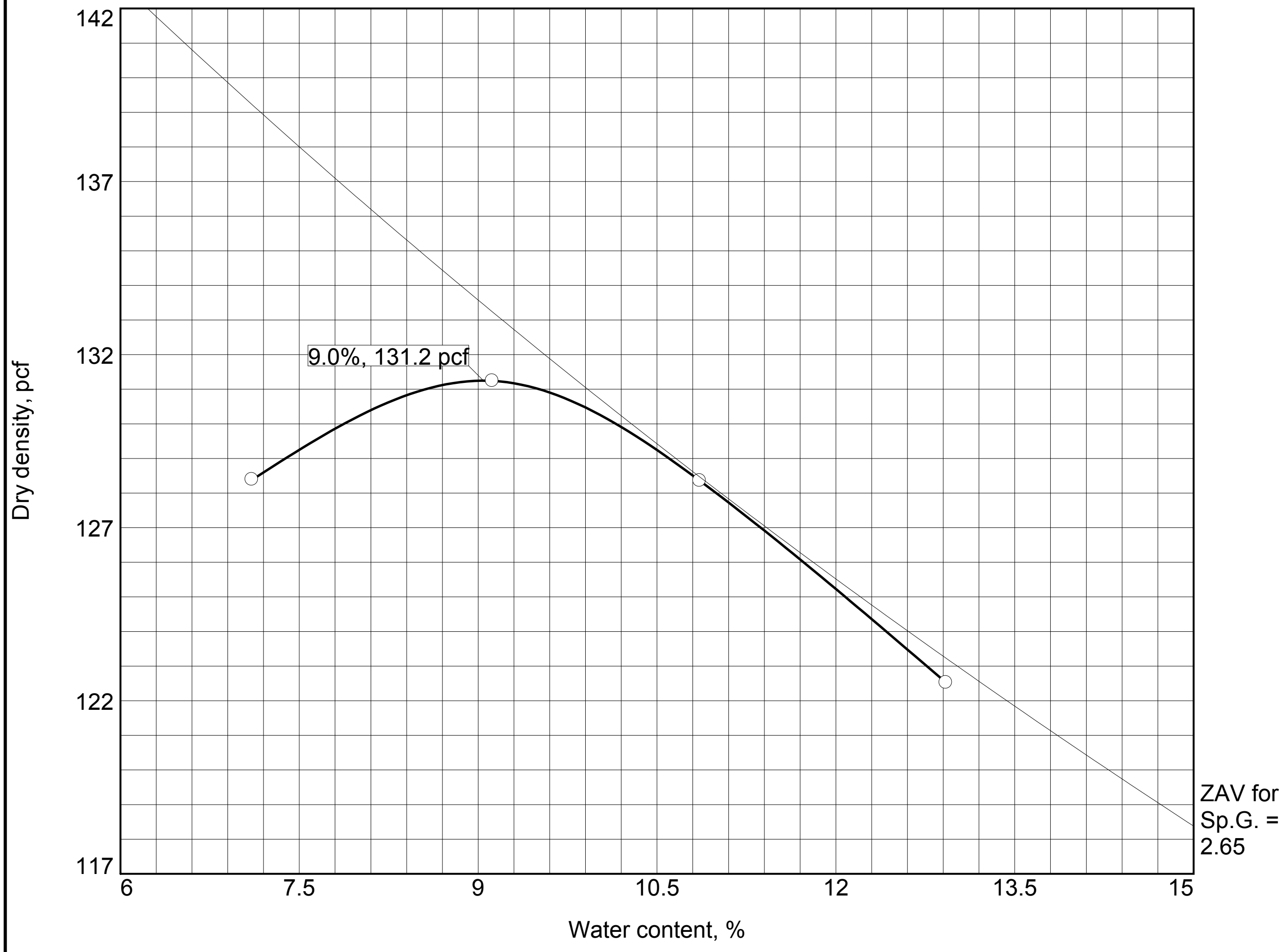
Project: Shadowbrook Lift Station

Source of Sample: B2 **Depth:** 32.1-32.8' **Sample Number:** Run 5

Project No.: 2794.X **Figure** ________

Blackburn Consulting

Maximum Density Determination



Test specification: ASTM D 1557-07 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
0-5'	SM			2.65			2.85	

TEST RESULTS

Maximum dry density = 131.2 pcf

Optimum moisture = 9.0 %

MATERIAL DESCRIPTION

SILTY SAND, dark yellowish brown

Project No. 2794.X **Client:** Hatch Mott MacDonald

Project: Shadowbrook Lift Station

Date: 4/9/2015

○ **Source of Sample:** B3 **Sample Number:** Bag B

Blackburn Consulting

W. Sacramento, CA

Remarks:

Figure

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 04/17/15
Date Submitted 04/14/15

To: Bob Lokteff
Blackburn Consulting
2491 Boatman Ave
West Sacramento, 95691

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : SHADOWBROOK 2794.X Site ID: B2-1B
Thank you for your business.

* For future reference to this analysis please use SUN # 69242 - 143966

EVALUATION FOR SOIL CORROSION

Soil pH	6.45		
Minimum Resistivity	3.48	ohm-cm (x1000)	
Chloride	13.6	ppm	0.0014 %
Sulfate-S	10.2	ppm	0.001 %

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 04/17/15
Date Submitted 04/14/15

To: Bob Lokteff
Blackburn Consulting
2491 Boatman Ave
West Sacramento, 95691

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : SHADOWBROOK 2794.X Site ID: B4-4B
Thank you for your business.

* For future reference to this analysis please use SUN # 69242 - 143967

EVALUATION FOR SOIL CORROSION

Soil pH	6.42			
Minimum Resistivity	5.63	ohm-cm (x1000)		
Chloride	8.7	ppm	0.0009	%
Sulfate-S	7.6	ppm	0.0008	%

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

ADDENDUM

Auburn Office:
11521 Blocker Drive, Suite 110 ▪ Auburn, CA 95603
(530) 887-1494

Fresno Office: (559) 438-8411
Modesto Office: (209) 522-6273
West Sacramento Office: (916) 375-8706

Geotechnical ▪ Geo-Environmental ▪ Construction Services ▪

BCI File No. 2794.X
November 3, 2015

Mr. Candido Ramirez
Hatch Mott MacDonald
2495 Natomas Park Drive, Suite 530
Sacramento, CA 95833

Subject: **GEOTECHNICAL REPORT ADDENDUM**
Shadowbrook Sewer Lift Station and Force Main
Roseville, California

Dear Mr. Ramirez,

Blackburn Consulting (BCI) is pleased to submit this Geotechnical Report Addendum for the Shadowbrook Sewer Lift Station and Force Main project. After our Geotechnical Report dated July 28, 2015, Hatch Mott MacDonald (HMM) asked us to provide additional subsurface information for the force main crossing of Dry Creek. BCI prepared this addendum in accordance with our Proposal for Addendum Geotechnical Services (rev 1) dated September 10, 2015.

Originally, HMM planned a trenchless crossing of Dry Creek for the force main. Our initial report addressed geotechnical issues for a trenchless crossing. Due to the depth to rock and geometry restrictions, HMM is now considering a cut and cover crossing option. This addendum addresses the subsurface conditions we found in two additional borings drilled adjacent to Dry Creek, information to help quantify dewatering needs, and excavation conditions.

1 FIELD INVESTIGATION AND LABORATORY TESTING

1.1 Field Investigation

BCI drilled and sampled two additional borings on September 17 and 18th, 2015. Boring depths ranged from 31.2 to 31.8 feet below ground surface (bgs). BCI planned the boring locations and depths based on discussion with HMM and site access. See Appendix A for methodology and boring logs and Figure 1 (Site Plan) for boring locations.

1.2 Laboratory Testing

We completed the following laboratory tests on representative soil/rock samples from our exploratory borings:

- Sieve Analysis (ASTM D 6913) for soil classification and soil characteristics
- Unconfined Compression (ASTM D 7012) for rock strength
- Hydraulic Conductivity (ASTM D 5084) for seepage evaluation

We attach laboratory test results in Appendix B and show them on the boring logs where appropriate.

2 SUBSURFACE CONDITIONS

2.1 Soil and Rock Conditions

See Figure 1 (updated to our July 28, 2015 report) for B5 and B6 locations. We summarize the subsurface conditions in Table 1 and attach the boring logs in Appendix A.

TABLE 1: Summary of Subsurface Conditions

Boring No.	General Location	Approximate Boring Elevation*	General Soil and Rock Conditions
B5	West bank of Dry Creek	143.0	143.0-137.5 – Loose to medium dense, Poorly Graded Sand, Silty Sand, and Well Graded Gravel 137.5-125.0 – Intensely to slightly weathered, soft to moderately hard, volcanic breccia 125.0-111.8 – Moderately weathered, moderately soft sandstone
B6	East bank of Dry Creek	151.2	151.2-145.2 – Loose, Poorly Graded Sand 145.2-136.2 – Medium dense, Poorly Graded Gravel 136.2-119.4 – Intensely to moderately weathered, soft to moderately soft, volcanic breccia

*Approximate ground surface elevation at time of drilling

Volcanic breccia from B5 and B6 has an unconfined compressive strength of 1,244 to 1,395 psi (B6 and B5 respectively). See Appendix B for the tests results.

2.2 Groundwater

We encountered groundwater in B5 at 4.5 feet below ground surface (Approximate Elev. 138.5 feet). We did not measure ground water in B6 due to drill methods used and the presence of drill fluid.

3 ADDENDUM GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

3.1 Excavation

We found the soils and rock in B5 and B6 to be relatively consistent with those in our initial investigation. Excavations will require sloping and/or shoring in accordance with Cal OSHA requirements. Based on our subsurface exploration, the contractor should base preliminary excavation and shoring design on Type C soil, granular soils including gravel and sand (see Cal OSHA regulations). In the area of Dry Creek Type C soils extend from the ground surface to elevations of approximately136 to 138 feet (borings B6 and B5 respectively) with Stable Rock below that.

For Type C soil conditions, slope excavations at 1.5(H):1(V); for Stable Rock, cut excavations vertically with review by an engineering geologist for adverse-dipping discontinuities (foliation and fracture). For shoring design do not rely on excavations in Type C soils to stand vertically for even short time periods.

The contractor is responsible for the safety of all excavations and should provide appropriate excavation sloping and shoring in accordance with current Cal OSHA requirements (based on actual soil and rock conditions encountered) and observe conditions during construction for necessary modification and safety.

3.1 Seepage

During construction we expect groundwater will be at or near the water elevation of Dry Creek (approximate elev. 140 feet). Granular soils that overlay the breccia will transmit significant water to open excavations. Our test on a representative granular soil indicates a hydraulic conductivity (K) of 8.33 ft/day (typical of published[1] values for silty sands and well sorted sands). Hydraulic Conductivity for volcanic breccia was estimated to be 0.01 ft/day (USGS, 1983[2]). Based on an assumed hydraulic gradient of 1, expect the following inflow rates per square foot of open trench (below groundwater):

- 62 gal/ft^2 for granular soils.
- 0.07 gal/ft^2 for volcanic breccia.

Use these flow rates for initial planning only. Actual flow rates may be significantly different. Flow through fractures in the volcanic breccia may produce significantly greater volumes of seepage than those stated above. Dewatering means and methods are the responsibility of the contractor.

---

[1] C.W. Fetter, 1994, Applied Hydrogeology, Prentice Hall, Inc.

[2] Heath, R.C., 1983. Basic ground-water hydrology, U.S. Geological Survey Water-Supply Paper 2220, 86p.

Thank you for selecting BCI to be on your design team. Please call if you have questions or require additional information.

Sincerely,

BLACKBURN CONSULTING

Reviewed by:

ROBERT C. PICKARD
No. 2508

THOMAS W. BLACKBURN
No. 2311

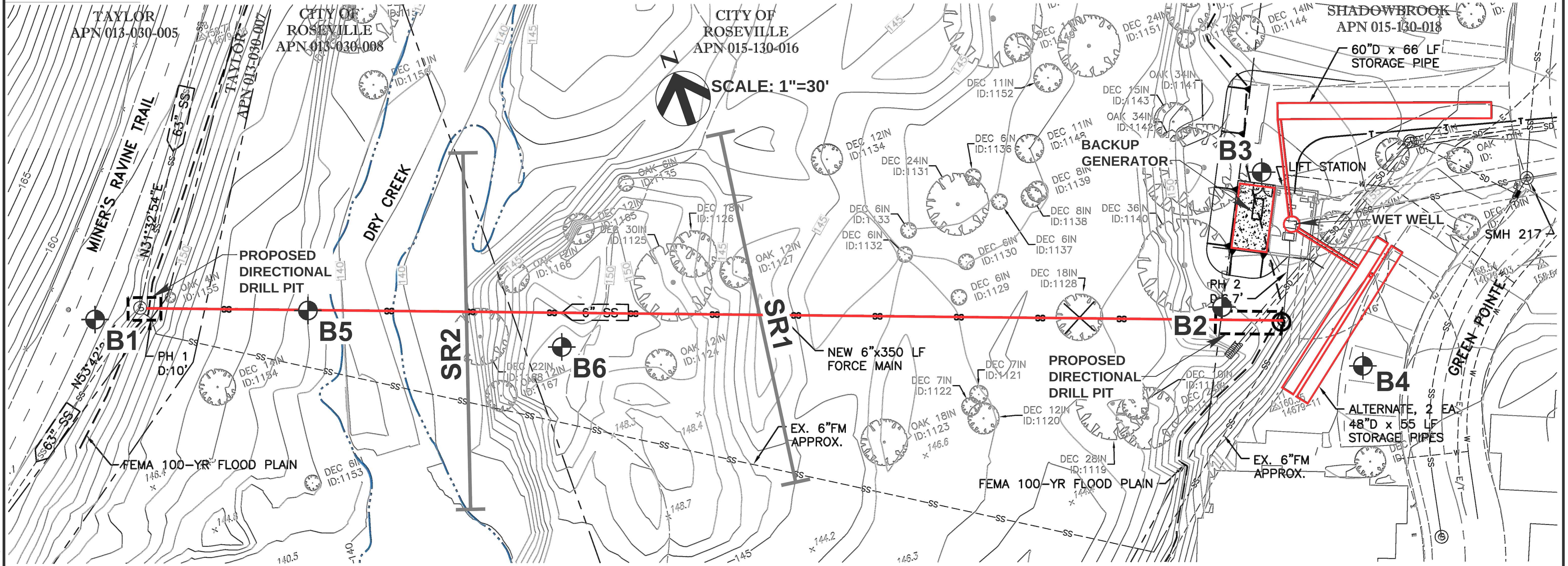
Rob Pickard, C.E.G.
Project Engineering Geologist

Thomas W. Blackburn, P.E., G.E.
Principal

Attachments:
Figure 1- Site Plan
Figure 2- Site Profile
Appendix A- Boring Logs (B5 and B6) and Boring Log Legend
Appendix B- Laboratory Test Results

FIGURE 1

Site Plan



LEGEND

B1 Approximate Boring Location

SR1 Approximate Refraction Seismic Line Location

Proposed Improvements

SOURCE: Topography by Andregg Geomatics, March 2015. Site improvements by HMM, April 2015.

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www.blackburnconsulting.com

SITE PLAN
Shadowbrook Pump Station
Roseville, California

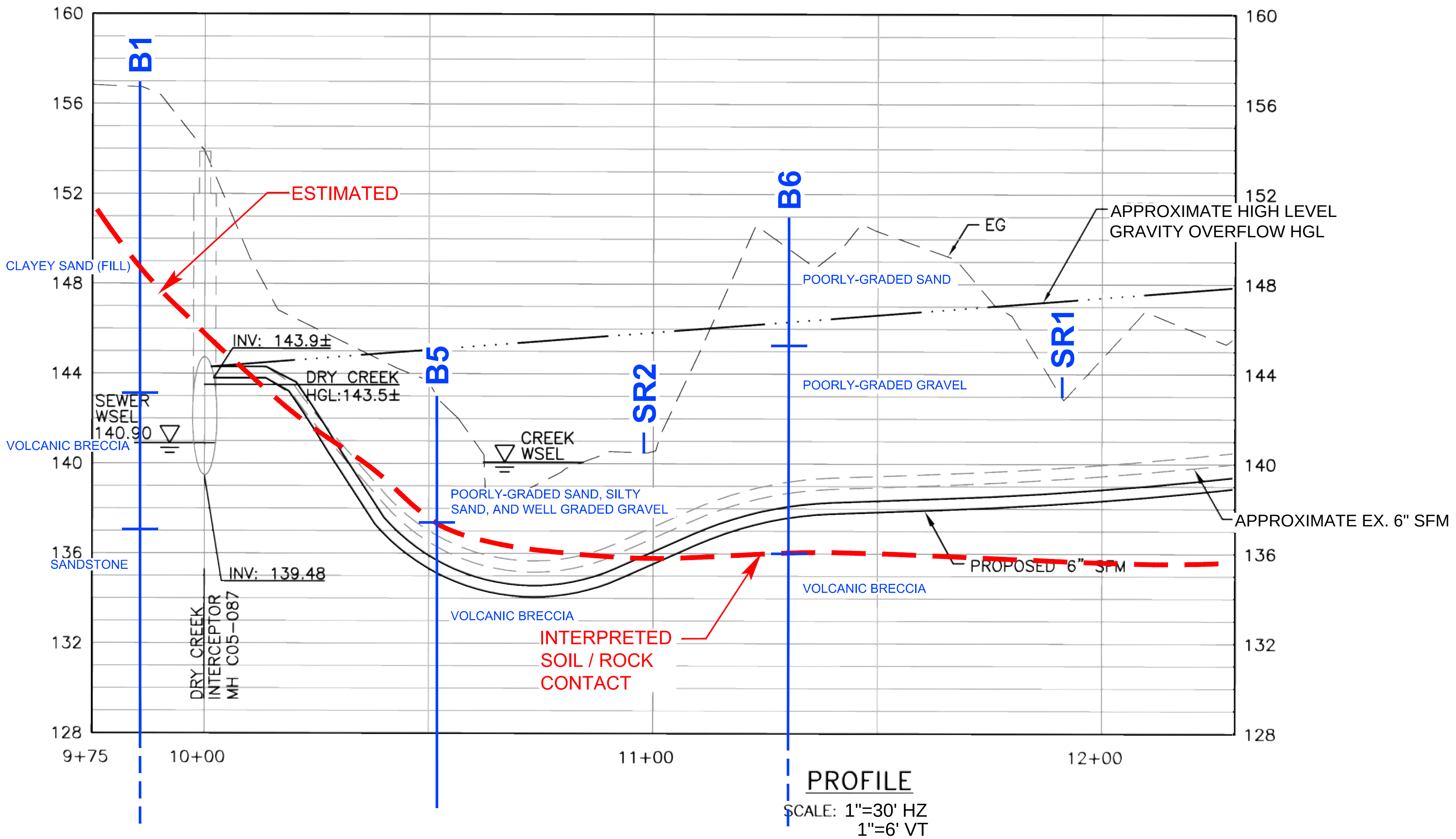
File No. 2794.x

November 2015

Figure 1

FIGURE 2

Site Profile



PROFILE
SCALE: 1"=30' HZ
1"=6' VT

SOURCE: **Preliminary Draft 06-19-2015, Plan and Profile drawing SFM1, Sta. 10+00 to 10+XX, Sheet C-01 by Hatch Mott MacDonald, dated 03/27/15.**

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consulting

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SITE PROFILE
Shadowbrook Pump Station
Roseville, California

File No. 2794.x

November 2015

Figure 2

2794.x Fig2 Shadowbrook Pump Station.dwg

APPENDIX A

Boring Logs (B5 and B6)
Boring Log Legend

Exploratory Drilling Methodology

Our drilling subcontractor (Taber Drilling) drilled the borings with hollow-stem (8-inch diameter) auger techniques in soil and penetrable rock. Harder, more competent rock was drilled and sampled with HQ wire-line coring techniques. We obtained soil samples at various intervals using either a 3.0-inch O.D. Modified California (MC) sampler (equipped with 2.4-inch diameter brass liners). Taber drove samplers were with an automatic hammer, weighing 140-pounds and falling approximately 30 inches.

Rob Pickard, C.E.G., and Pat Fischer, P.E., C.E.G. logged the borings and retrieved samples for laboratory testing. We used plastic caps to seal and label the 2.4-inch diameter, 6-inch long brass tubes retrieved from MC sampling. Samples from SPT sampling were placed in labeled zip lock bags. We also retrieved bulk soil samples from soil cuttings. We placed rock core samples in labeled core boxes.

LOGGED BY
PFF

BEGIN DATE
9-17-15

COMPLETION DATE
9-17-15

BOREHOLE LOCATION (Lat/Long or North/East and Datum)
38.753527° / -121.27071°

HOLE ID
B5

DRILLING CONTRACTOR
Taber

BOREHOLE LOCATION (Offset, Station, Line)

SURFACE ELEVATION
~143.0 ft

DRILLING METHOD
HQ Core

DRILL RIG
CME 55 Crawler

BOREHOLE DIAMETER
4 in

SAMPLER TYPE(S) AND SIZE(S) (ID)
2.5" Cal Mod, HQ Core

HAMMER TYPE
Safety semi-automatic drop (140#/ 30")

HAMMER EFFICIENCY, ERi
80%

BOREHOLE BACKFILL AND COMPLETION
Grout Backfilled 9/17/15

GROUNDWATER READINGS DURING DRILLING **4.5 ft** AFTER DRILLING (DATE)

TOTAL DEPTH OF BORING
31.2 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (psi)	Additional Lab Tests	Drilling Method	Casing Depth
	0		Poorly graded SAND; SP; loose; light gray brown; dry. Fine to medium grained sand.		Bag D			100											
	1																		
141.00	2		Becomes gravelly (gravel up to 1.5-inch in diamter)		1	10 9 7	16	100									P		
	3		SILTY SAND with gravel; SM; medium dense; light gray to brown; moist. Silt approximately 15%; fine to medium grained sand.																
139.00	4																		
	5		Well graded GRAVEL with silt and sand; GW; medium dense; grayish brown; wet.		2	50		28								PP = 4.5+ tsf			
137.00	6		VOLCANIC BRECCIA; massive; brown to gray-brown; intensely to moderately weathered; soft to moderately soft; moderately fractured.																
	7		VOLCANIC BRECCIA; massive; brown to gray-brown; slightly to moderately weathered; moderately soft to moderately hard; slightly fractured.		1			98	94										
135.00	8																		
	9										124					UC Rock =1395	UC		
133.00	10																		
	11				2			100	95										
131.00	12																		
	13																		
129.00	14																		
	15																		
127.00	16				3			100	100										
	17																		
125.00	18		SANDSTONE; fine to medium grained sandstone; massive; gray to olive brown moderately weathered; moderately soft; slightly fractured. Moderately well cemented.																
	19																		
123.00	20																		
	21				4			100	100										
121.00	22																		
	23																		
119.00	24																		
	25																		

(continued)

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PROJECT NAME
Shadowbrook Lift Station

FILE NO.
2794.X

HOLE ID
B5

COUNTY
PLA

ROUTE

POSTMILE

CLIENT
Hatch Mott MacDonald

PREPARED BY
PFF

CHECKED BY
RCP

SHEET
1 of 2

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (psi)	Additional Lab Tests	Drilling Method	Casing Depth
	25		SANDSTONE; fine to medium grained sandstone; massive; gray to olive brown moderately weathered; moderately soft; slightly fractured. Moderately well cemented.		4			100	100										
117.00	26				5			88	68										
	27																		
115.00	28		SANDSTONE; medium to coarse grained sandstone; massive; gray to olive brown, moderately weathered; soft. Slightly cemented.																
	29																		
113.00	30																		
	31																		
111.00	32		Bottom of exploration at 31.2 ft bgs																
	33		Grout Backfilled 9/17/15																
109.00	34																		
	35																		
107.00	36																		
	37																		
105.00	38																		
	39																		
103.00	40																		
	41																		
101.00	42																		
	43																		
99.00	44																		
	45																		
97.00	46																		
	47																		
95.00	48																		
	49																		
93.00	50																		
	51																		
91.00	52																		
	53																		
89.00	54																		
	55																		

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PROJECT NAME **Shadowbrook Lift Station**		FILE NO. **2794.X**	HOLE ID **B5**
COUNTY **PLA**	ROUTE		POSTMILE
CLIENT **Hatch Mott MacDonald**			
PREPARED BY **PFF**	CHECKED BY **RCP**		SHEET **2 of 2**

LOGGED BY **RCP**	BEGIN DATE **9-18-15**	COMPLETION DATE **9-18-15**	BOREHOLE LOCATION (Lat/Long or North/East and Datum) **38.753428° / -121.270459°**	HOLE ID **B6**
DRILLING CONTRACTOR **Taber**			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION **~151.2 ft**
DRILLING METHOD **HQ Core**			DRILL RIG **CME 55 Crawler**	BOREHOLE DIAMETER **4 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **2.5" Cal Mod, HQ Core**			HAMMER TYPE **Safety semi-automatic drop (140#/ 30")**	HAMMER EFFICIENCY, ERi **80%**
BOREHOLE BACKFILL AND COMPLETION **Grout backfilled 9/18/15**			GROUNDWATER READINGS — DURING DRILLING **Not measured** — AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING **31.8 ft**

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (psi)	Additional Lab Tests	Drilling Method	Casing Depth
	0	Poorly graded SAND; SP; loose; light yellow brown to olive gray; dry to moist		Bag A			100				11					PA		
	1																	
149.20	2			1	3 3 4	7	100											
	3																	
147.20	4																	
	5			2	4 5 11	16	100				55					PA		
145.20	6	SILTY SAND; SM; medium dense; light gray; moist; weakly cemented																
	7	Poorly graded GRAVEL; GP; medium dense; light gray to olive brown; moist																
143.20	8																	
	9																	
141.20	10			3	36 21 15	36	22											
	11																	
139.20	12																	
	13																	
137.20	14																	
	15	VOLCANIC BRECCIA; massive; brown; intensely to moderately weathered; soft to moderately soft; slightly to moderately fractured		4	28 26 50	76	100											
135.20	16																	
	17			Run 1			0	0										
133.20	18	becomes moderately to slightly weathered; soft to moderately hard		Run 2			98	98										
	19																	
131.20	20									121					UC Rock =1244	UC		
	21																	
129.20	22			Run 3			100	87										
	23																	
127.20	24																	
	25																	

(continued)

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PROJECT NAME **Shadowbrook Lift Station**		FILE NO. **2794.X**	HOLE ID **B6**
COUNTY **PLA**	ROUTE		POSTMILE
CLIENT **Hatch Mott MacDonald**			
PREPARED BY **RCP**	CHECKED BY **PFF**		SHEET **1 of 2**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION/REMARKS	Sample Type	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	% <200 Sieve	Plasticity Index	Phi Angle (°)	Shear Strength (psf)	Unconfined Compressive Strength (psi)	Additional Lab Tests	Drilling Method	Casing Depth
	25		VOLCANIC BRECCIA; massive; brown; moderately to slightly weathered; soft to moderately hard; slightly to moderately fractured		Run 3			100	87										
125.20	26																		
	27				Run 4			88	88										
123.20	28																		
	29																		
121.20	30																		
	31																		
119.20	32																		
	33																		
117.20	34																		
	35																		
115.20	36																		
	37																		
113.20	38																		
	39																		
111.20	40																		
	41																		
109.20	42																		
	43																		
107.20	44																		
	45																		
105.20	46																		
	47																		
103.20	48																		
	49																		
101.20	50																		
	51																		
99.20	52																		
	53																		
97.20	54																		
	55																		

Bottom of exploration at 31.8 ft bgs

Grout backfilled 9/18/15

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PROJECT NAME **Shadowbrook Lift Station**		FILE NO. **2794.X**	HOLE ID **B6**
COUNTY **PLA**	ROUTE		POSTMILE
CLIENT **Hatch Mott MacDonald**			
PREPARED BY **RCP**	CHECKED BY **PFF**		SHEET **2 of 2**

GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names	Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435-04)
CL	Collapse Potential (ASTM D 5333-03)
CP	Compaction Curve (CTM 216 - 06)
CR	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
CU	Consolidated Undrained Triaxial (ASTM D 4767-02)
DS	Direct Shear (ASTM D 3080-04)
EI	Expansion Index (ASTM D 4829-03)
M	Moisture Content (ASTM D 2216-05)
OC	Organic Content (ASTM D 2974-07)
P	Permeability (CTM 220 - 05)
PA	Particle Size Analysis (ASTM D 422-63 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
PL	Point Load Index (ASTM D 5731-05)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301 - 00)
SE	Sand Equivalent (CTM 217 - 99)
SG	Specific Gravity (AASHTO T 100-06)
SL	Shrinkage Limit (ASTM D 427-04)
SW	Swell Potential (ASTM D 4546-03)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
UW	Unit Weight (ASTM D 4767-04)
VS	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- 2.5" ID Sampler
- 2" ID Sampler
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- ▽ First Water Level Reading (during drilling)
- ▼ Static Water Level Reading (short-term)
- ▼ Static Water Level Reading (long-term)

blackburn consulting

Blackburn Consulting
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Auburn, CA 95603
Phone: (530) 887-1494
Fax: (530) 887-1495

BORING RECORD LEGEND

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	Pocket Penetrometer (tsf)	Torvane (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60} - Value (blows / foot)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Descriptor	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE

Descriptor		Size
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS

Descriptor	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION

Descriptor	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

<u>NOTE</u>: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

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BORING RECORD LEGEND

ROCK GRAPHIC SYMBOLS

⊠	IGNEOUS ROCK
▤	SEDIMENTARY ROCK
▨	METAMORPHIC ROCK

BEDDING SPACING

Descriptor	Thickness or Spacing
Massive	> 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8 inches to 1 ft
Thinly bedded	1-1/4 to 3-5/8 inches
Very thinly bedded	3/8 inch to 1-1/4 inches
Laminated	< 3/8 inch

WEATHERING DESCRIPTORS FOR INTACT ROCK

	Diagnostic Features					
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering and Grain Boundary Conditions	Texture and Solutioning		
Descriptor	Body of Rock	Fracture Surfaces		Texture	Solutioning	General Characteristics
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No solutioning	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull	Minor to complete discoloration or oxidation of most surfaces	No visible separation, intact (tight)	Preserved	Minor leaching of some soluble minerals may be noted	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty"; feldspar crystals are "cloudy"	All fracture surfaces are discolored or oxidized	Partial separation of boundaries visible	Generally preserved	Soluble minerals may be mostly leached	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation (refer to grain boundary conditions)	All fracture surfaces are discolored or oxidized; surfaces are friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Altered by chemical disintegration such as via hydration or argillation	Leaching of soluble minerals may be complete	Dull sound when struck with hammer; usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures or veinlets. Rock is significantly weakened.
Decomposed	Discolored of oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay		Complete separation of grain boundaries (disaggregated)	Resembles a soil; partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes".

Note: Combination descriptors (such as "slightly weathered to fresh") are used where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant identifiable zones can be delineated. Only two adjacent descriptors shall be combined. "Very intensely weathered" is the combination descriptor for "decomposed to intensely weathered".

RELATIVE STRENGTH OF INTACT ROCK

Descriptor	Uniaxial Compressive Strength (psi)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

ROCK HARDNESS

Descriptor	Criteria
Extremely Hard	Specimen cannot be scratched with pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows
Very hard	Specimen cannot be scratched with pocket knife or sharp pick; breaks with repeated heavy hammer blows
Hard	Specimen can be scratched with pocket knife or sharp pick with heavy pressure; heavy hammer blows required to break specimen
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure; breaks with moderate hammer blows
Moderately Soft	Specimen can be grooved 1/6 in. with pocket knife or sharp pick with moderate or heavy pressure; breaks with light hammer blow or heavy hand pressure
Soft	Specimen can be grooved or gouged with pocket knife or sharp pick with light pressure, breaks with light to moderate hand pressure
Very Soft	Specimen can be readily indented, grooved, or gouged with fingernail, or carved with pocket knife; breaks with light hand pressure

CORE RECOVERY CALCULATION (%)

$$\frac{\Sigma \text{ Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

FRACTURE DENSITY

Descriptor	Criteria
Unfractured	No fractures
Very Slightly Fractured	Lengths greater 3 ft
Slightly Fractured	Lengths from 1 to 3 ft, few lengths outside that range
Moderately Fractured	Lengths mostly in range of 4 in. to 1 ft, with most lengths about 8 in.
Intensely Fractured	Lengths average from 1 in. to 4 in. with scattered fragmented intervals with lengths less than 4 in.
Very Intensely Fractured	Mostly chips and fragments with few scattered short core lengths

RQD CALCULATION (%)

$$\frac{\Sigma \text{ Length of intact core pieces > 4 in.}}{\text{Total length of core run (in.)}} \times 100$$

blackburn consulting

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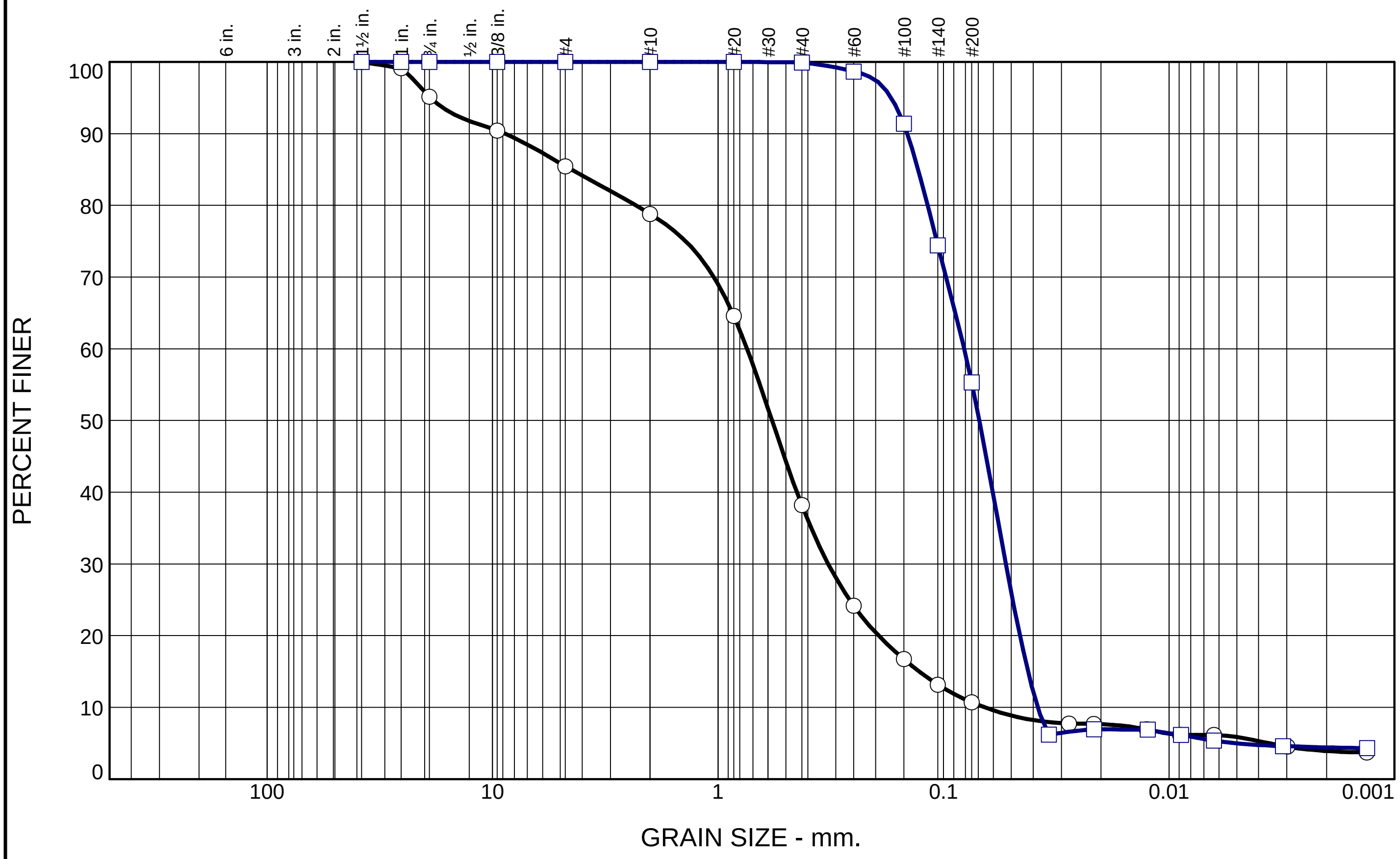
BORING RECORD LEGEND

APPENDIX B

Laboratory Test Results

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0	15	74	5	6	SM			
□	0	0	45	50	5	ML			

SIEVE inches size	PERCENT FINER ○	 □	
1.5"	100	100	
1"	99	100	
3/4"	95	100	
3/8"	90	100	
	GRAIN SIZE		
D_{60}	0.7428	0.0810	
D_{30}	0.3244	0.0529	
D_{10}	0.0656	0.0382	
	COEFFICIENTS		
C_c	2.16	0.90	
C_u	11.33	2.12	

SIEVE number size	PERCENT FINER ○	 □	
#4	85	100	
#10	79	100	
#20	65	100	
#40	38	100	
#60	24	99	
#100	17	91	
#140	13	74	
#200	11	55	

Material Description

○ SILTY SAND, olive brown

□ SANDY SILT, yellowish brown

REMARKS:

○

□

○ Source of Sample: B6 Sample Number: Bulk D

□ Source of Sample: B6 Sample Number: 2b

Blackburn Consulting

W. Sacramento, CA

Client: Hatch Mott MacDonald

Project: Shadowbrook Lift Station

Project No.: 2794.X

Figure

Auburn Office:
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(530) 887-1494 ▪ Fax (530) 887-1495

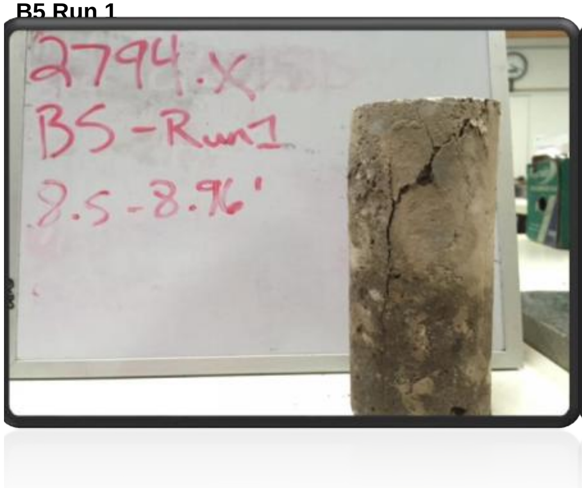
Modesto Office: (209) 522-6273
West Sacramento Office: (916) 375-8706

Rock Core Compression Test

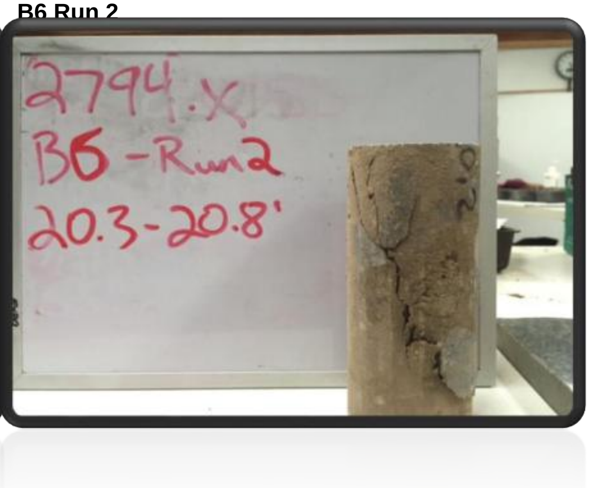
BCI File No.: 2794.x
Project Name: Shadowbrook Lift Station **Date: 10/19/15**

Specimen	Depth (ft)	FINAL TRIM LENGTH (in.)	ORIGINAL LENGTH	DIAMETER (in.)	AREA (in.^{2})	TOTAL LOAD (lbs.)	COMP STRENGTH (psi)	L/D RATIO	CORE WEIGHT (grams)	UNIT WEIGHT (pcf)
B5 Run 1	8.5-9.0'	5.700	6.000	2.390	4.48	6253	1,395	2.38	835.5	124
B6 Run 2	20.3-20.8'	5.770	6.000	2.400	4.52	5627	1,244	2.40	829.7	121

B5 Run 1



B6 Run 2



Hydraulic Conductivity of Saturated Porous Material
ASTM D 5084 (Method C)

Project: **Shadowbrook Lift Station**
Project Number: **2794.1**
Date: **10/15/2015**

Sample Number: **B5-1b** **Depth:** **2.0-2.5'**
Material Description: **SM**
Sample Collection Date: 09/17/15

Sample Data:

Type of Sample = **2.4" SS Cal Mod**

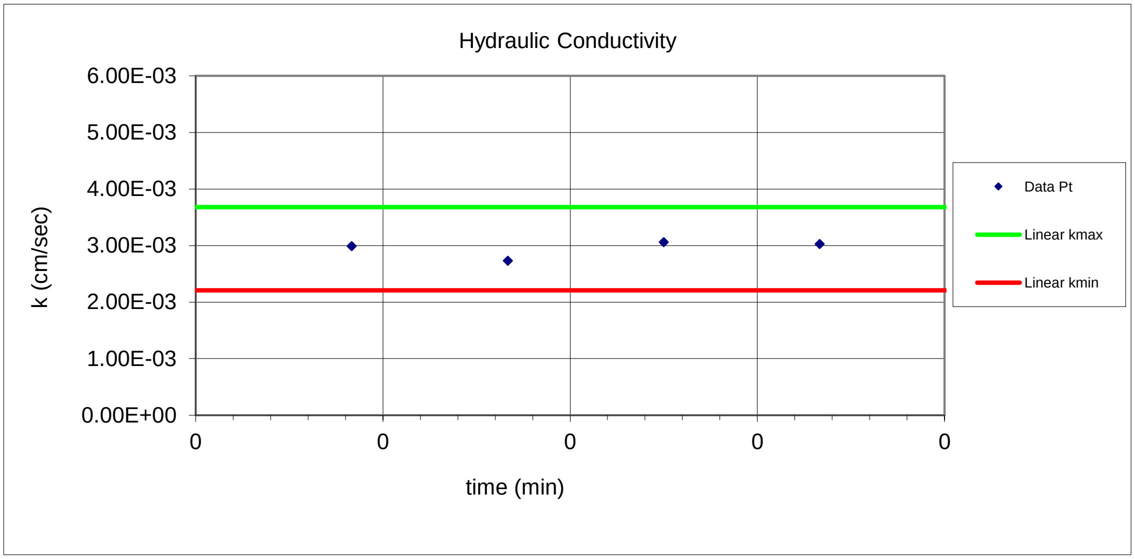
Initial Data:			**Final Data:**		
Sample Length =	13.7	cm	Sample Length =	13.6	cm
Sample Diameter =	6.35	cm	Sample Diameter =	6.26	cm
Area =	31.7	cm^2	Area =	30.7	cm^2
Volume =	433.1	cm^3	Volume =	418.5	cm^3
Wet Weight=	729.5	g	Wet Weight=	856.3	g
Moisture =	4.0	%	Moisture =	22.1	%
Dry Density =	1.62	g/cm^3	Dry Density =	1.68	g/cm^3
Dry Density =	101.1	pcf	Dry Density =	104.6	pcf
Saturation =	16.7	%	Saturation =	100.8	%
Specific Gravity =	2.65	(assumed)	Specific Gravity =	2.65	(assumed)

Testing Parameters:

B Value = 0.975
Cell Pressure P_C= 77 psi
Bottom Pressure P_b= 70 psi
Top Pressure P_T= 70 psi
Consolidation = 7 psi
Confining Pressure = 1008 psf

Permeant: Deaired Water
Aver. Temp= 72.4 °F
Burette Area= 0.194 cm^2
Initial Hydraulic Gradient= 3.95
Final Hydrualic Gradient= 1.00

Results: **Average k (cm/sec)= 2.94E-03 cm/sec**



Hydraulic Conductivity of Saturated Porous Material
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Project: **Shadowbrook Lift Station**
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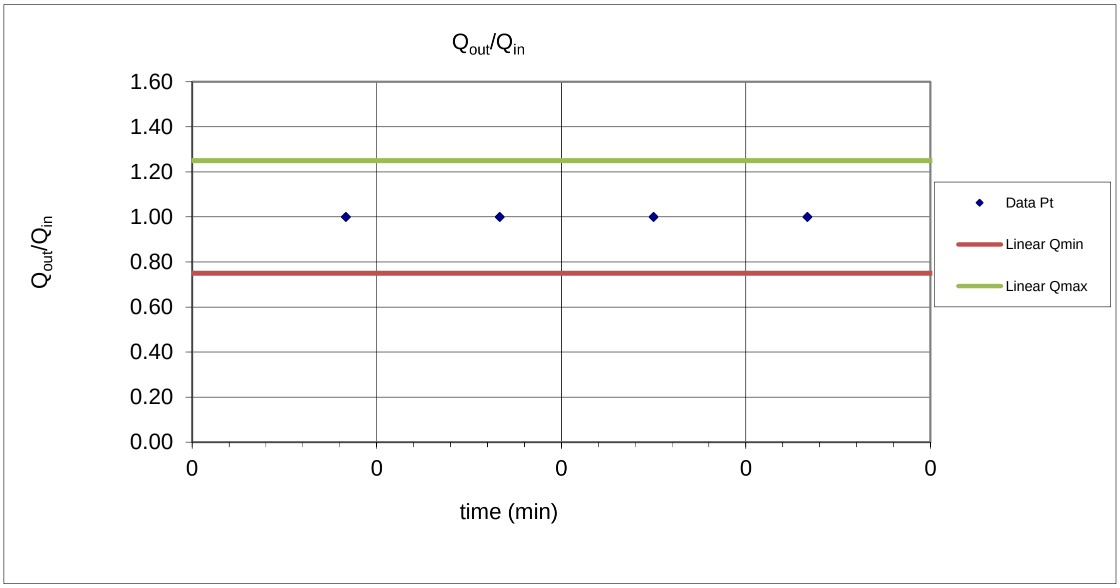
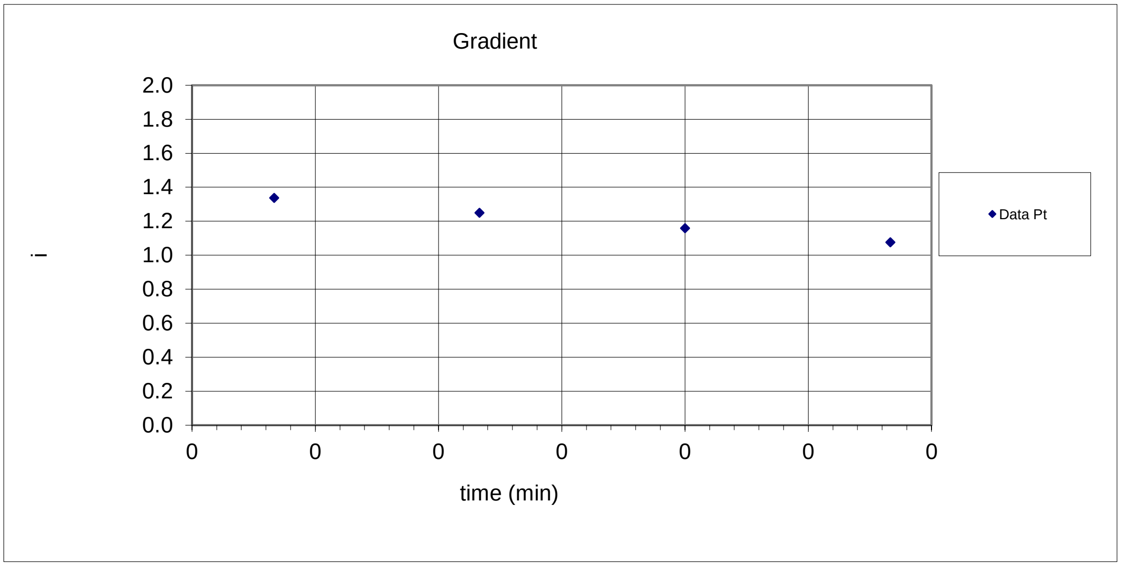
Material Description: **SM**
Sample Collection Date: 09/17/15

Average k (cm/sec): **2.94E-03** **cm/sec**





APPENDIX E

Floodplain Assessment

Storm Water Consulting Inc. 1899 Sapphire Way, El Dorado Hills, CA 95762 Phone: (916) 801-3962 Fax: (916 933-4375

MEMORANDUM

Date: July 21, 2015 (Updated: March 15, 2016)

To: Dorienne Mendoza & Chris Stabenfeldt, ECORP Consulting, Inc.

From: Jim Nelson

Subject: Shadowbrook Lift Station and Force Main
Assessment of Impacts to Dry Creek 100-Year Floodplain

SWC File: 2015-98

SWC has completed an investigation of the impacts of implementation of the proposed Shadowbrook Lift Station and Force Main upgrades upon base flood elevations (100-year flood, existing and future conditions) for Dry Creek, which is contiguous to the proposed project. The base floods that have been considered are for the existing development condition 100-year flood (FEMA) and the City's future, fully-developed, unmitigated (FFDU) 100-year flood. The FFDU base flood information assumes full build-out conditions of the upstream watershed per the General Plans from upstream agencies, without the benefit of peak flow mitigation from upstream development. The investigation has included the following:

- Field reconnaissance.
- Review of a Draft Technical Memorandum - Recommended Upgrades for the proposed project dated June 18, 2015 by HMM and Calton Engineering, including preliminary draft plans for the project.
- Review of plan Sheets C-07, C-08, and C-09 for the proposed project by HMM dated January/February 2016.
- Review of the current "effective" Flood Insurance Study and Flood Insurance Rate Map Panel 0479 for Placer County, California and Incorporated Areas published by FEMA dated November 21, 2001. Base flood elevations are based on NGVD 29 within these documents.

- Review of a “preliminary” Flood Insurance Rate Map Panel 944 for Placer County, California and incorporated Areas published by FEMA dated March 29, 2010. Based flood elevations are based on NAVD 88 on this map panel.
- Review of an FFDU Floodplain map for the area provided by the City of Roseville. Base flood elevations are based on NGVD 29 on this map.
- Review of topographic mapping prepared for the project site and the local surrounding area by Andregg Geomatics dated March 17, 2015. Topographic contours and elevations are based on NAVD 88 on this topographic mapping.
- Review of available aerial photography covering the project site and the surrounding area by Terraserver.

According to the “effective” and the more recent “preliminary” Flood Insurance Rate Maps covering the project site location and the FFDU Floodplain map, the existing and the proposed version of the Shadowbrook Lift Station are located outside of the regulatory Floodway but inside of the 100-year Floodplain for Dry Creek. Exhibit A is an excerpt of the “effective” map and Exhibit B is the “preliminary” map. The regulatory Floodway and Floodplain delineations are the same in this area on both maps, but the base flood elevations are different on each map as they reference different datums. In order to provide a direct comparison between the topographic mapping for the project and the elevation of the base flood, Exhibit B was used for existing conditions evaluations as base flood elevations are shown thereon with reference to NAVD 88. By interpolation of base flood elevations shown on Exhibit B, we have estimated that the FEMA elevation of the base flood affecting the project site is 154.3 feet. The FFDU Floodplain map (Exhibit D) depicts a future base flood elevation of about 152.7 feet at NGVD 29 datum, which converts to about elevation 155.2 feet at NAVD 88 datum, when adjusted by +2.47 feet as cited in the preliminary Flood Insurance Study (FIS) from FEMA.

According to the topographic mapping of the project site as supplemented by field reconnaissance, the existing and proposed site improvements are located on a “bench” or “shelf” at the edge of the floodplain and would have a maximum depth of flooding of about 2 feet during the existing condition 100-year flood and about 2.9 feet during the FFDU 100-year flood for Dry Creek. Exhibit C is Sheet 3 of the topographic mapping prepared by Andregg Geomatics that depicts site elevations, site features and surrounding features and elevations. Just to the west of the bench area, the grade drops down several feet and into the effective flow conveyance area for Dry Creek. The actual Dry Creek channel is several additional feet lower and is located about 200 feet further to the northwest from the bench area. Flood profiles from the "effective" Flood Insurance Study indicate that the base flood for Dry Creek would have a depth of about 13 feet during the existing condition 100-year flood and about 9½ feet during the existing condition 10-year flood, measured from the Dry Creek channel.

The bench area resides between two large existing condominium buildings that are elevated above the base flood elevation for Dry Creek. The photographs shown on Plates 1 and 2 were taken during a field reconnaissance on July 1, 2015 and depict the view across the bench area from the corner of each of the two condominium buildings. In the bench area, the photographs depict the existing lift station structure, an existing shed, and portions of existing trees and shrubs that separate the bench area from deeper areas in the Dry Creek floodplain that reside outside of the projection of the existing buildings. The bench area creates a highly localized bulge in the 100-year floodplain, is not inundated during a 10-year flood and is only subjected to shallow inundation during a 100-year flood.

Plate 1
View Looking North Across the Existing Bench Area

Plate 2
Reverse View Looking South Across the Existing Bench Area

Plate 3 depicts a view of the bench area from the Dry Creek effective conveyance area and trees and shrubs near the top of slope leading up to the bench area.

Plate 3
View Looking Toward the Existing Bench Area from Initial Deeper Areas in the Dry Creek Floodplain

The plan view orientation of many of the features shown on Plates 1, 2, and 3 are depicted on Exhibit C.

The implementation of the proposed Shadowbrook Lift Station and Force Main upgrades will include the placement of about 81 cubic yards of fill limited to the bench area between the existing 10-year and 100-year flood elevations and 135 cubic yards of fill limited to the bench area between the FFDU 10-year and 100-year flood elevations. These are considered to be insignificant volumes from the standpoint of possible impacts caused by reductions in overbank storage during major flood events along Dry Creek.

Based on our review of available information and our field reconnaissance, it is our professional opinion that the bench area proposed to contain the upgrades to the Shadowbrook Lift Station is an “ineffective flow” or “non-conveyance” shallow ponding area during the occurrence of the existing condition and FFDU base floods in Dry Creek; and thus, the proposed upgrades to the existing lift station will not create any rise in flood levels during the passage of these base flood events. This conclusion considers the following:

- The topographic orientation of the elevated bench area within the edge of the floodplain and outside of the main conveyance area for flood flows in Dry Creek.
- The orientation of the bench area between two existing condominium buildings on each side of said area.
- Existing trees and shrubbery that separate the bench area from areas that are subject to deeper flooding within the Dry Creek floodplain.
- The minimal depth of inundation for the bench area (less than 2 feet FEMA and less than 2.9 feet FFDU).
- Site features that increase the hydraulic roughness of the bench area under existing conditions (such as an existing storage shed, the existing pump station enclosure, and appurtenant structures).

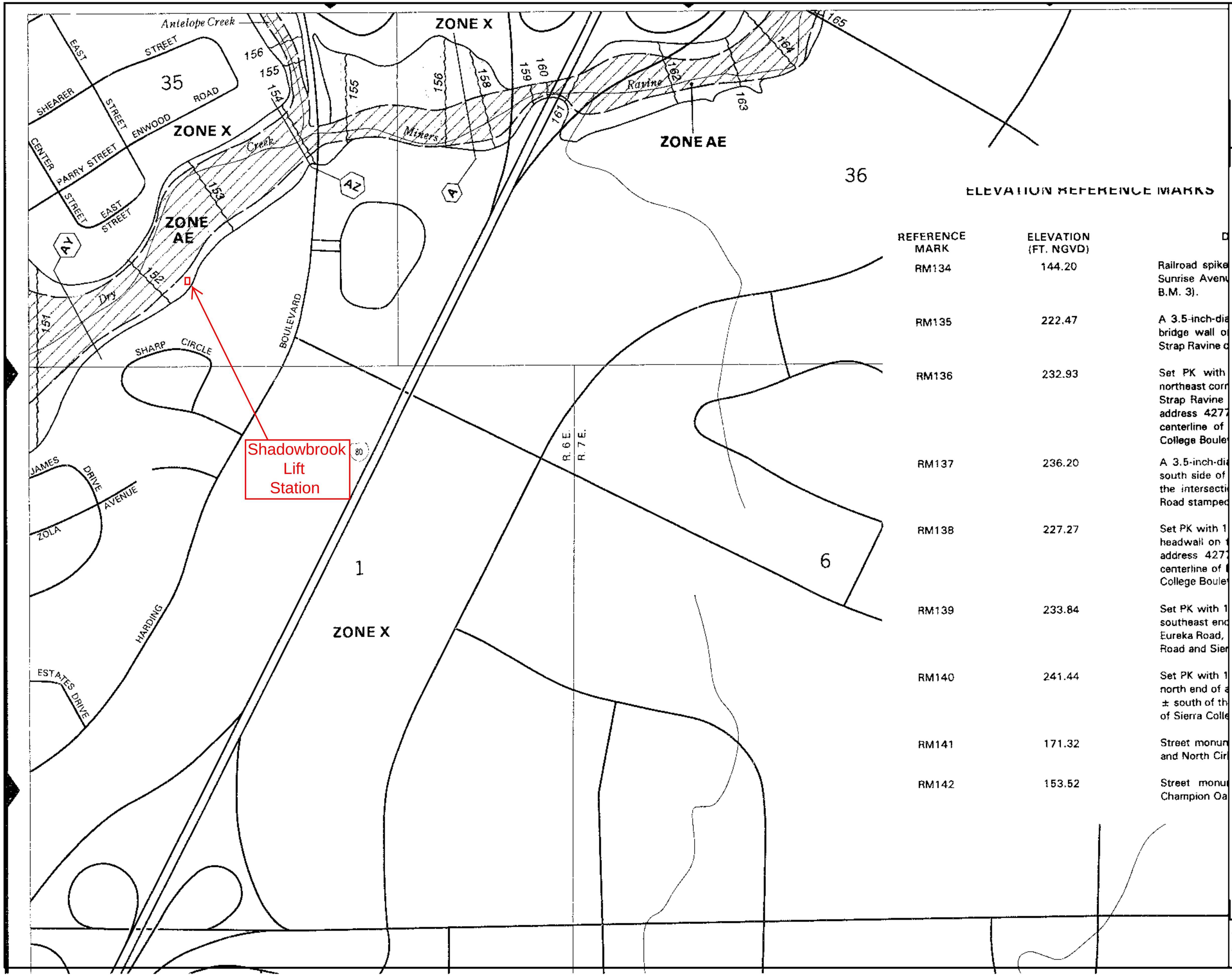
We believe that this conclusion may be made in a credible manner based on the physical conditions for the bench area and the information provided in this assessment. In our opinion, a detailed hydraulic modeling effort for the Dry Creek base flood is not warranted for this project, as it would not be effective in quantifying the precise impacts of such a minimal floodplain modification and would not alter the conclusions provided herein.

Regarding the installation of the new force main across the Dry Creek floodplain and channel, we understand that an open trench installation approach will be used to bury the pipe below existing grade. We recommend that this installation be performed during the dry season for this region. It is also necessary that the existing floodplain grades be restored along the force main alignment upon the completion of its installation.

<u>List of Exhibits</u>
Exhibit A – “Effective” FIRM (NGVD 29)
Exhibit B – “Preliminary” FIRM (NAVD 88)
Exhibit C – Topographic Map Showing Floodplain Information and Ineffective Flow Area
Exhibit D – City of Roseville FFDU Floodplain Map

REGISTERED PROFESSIONAL ENGINEER
JAMES H. NELSON
C 049474
EXP. 9-30-16
CIVIL
STATE OF CALIFORNIA

James H Nelson



Shadowbrook
Lift
Station

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	D
RM134	144.20	Railroad spike Sunrise Avenu B.M. 3).
RM135	222.47	A 3.5-inch-dia bridge wall o Strap Ravine c
RM136	232.93	Set PK with northeast corr Strap Ravine address 4277 centerline of College Boule
RM137	236.20	A 3.5-inch-dia south side of the intersecti Road stamped
RM138	227.27	Set PK with 1 headwall on t address 4277 centerline of College Boule
RM139	233.84	Set PK with 1 southeast end Eureka Road, Road and Sier
RM140	241.44	Set PK with 1 north end of a ± south of th of Sierra Colle
RM141	171.32	Street monum and North Cir
RM142	153.52	Street monu Champion Oa

N

APPROXIMATE SCALE IN FEET
500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

PLACER COUNTY,
CALIFORNIA AND
INCORPORATED AREAS

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ROSEVILLE, CITY OF	060243	0479	G
PLACER COUNTY UNINCORPORATED AREAS	060239	0479	G

MAP NUMBER
06061C0479 G

MAP REVISED:
NOVEMBER 21, 2001

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

EXHIBIT A - "Effective" FIRM (NGVD 29)

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 10. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Placer County Department of Public Works. Street centerlines were collected by mobile GPS units and compiled at a scale of 1:12,000 in 2006. Water surface features were derived from U.S. Geological Survey digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1989 or later.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

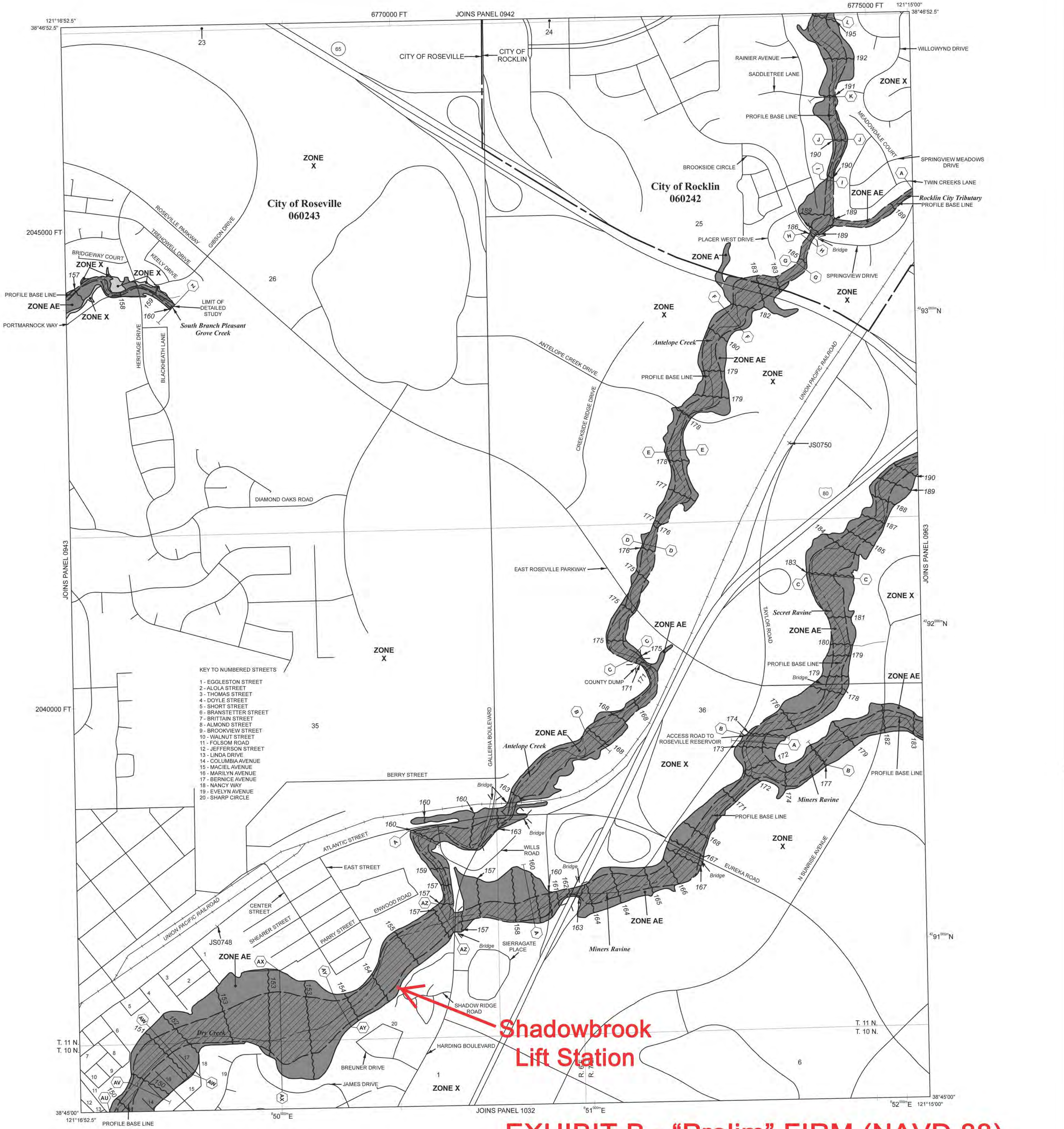


EXHIBIT B - "Prelim" FIRM (NAVD 88)

LEGEND

■	SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

▨	FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

▒	OTHER FLOOD AREAS
ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
□	OTHER AREAS
ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.
▧	COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS
▧	OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

———	Floodplain boundary
— — —	Floodway boundary
– — — –	Zone D boundary
• • • • • • •	CBRS and OPA boundary
▬	Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
▬	Limit of Moderate Wave Action
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

(A)——(A)	Cross section Line
(23)- - - -(23)	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
²⁴76⁰⁰⁰ᵐN	1000-meter Universal Transverse Mercator grid values, zone NAD 1983 UTM Zone 10N
600000 FT	5000-foot grid values: California State Plane coordinate system, zone II (FIPSZONE 0402), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 8, 1998

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
November 21, 2001 - to change/ add Base Flood Elevations, to update corporate limits, to change floodway, to incorporate previously issued Letters of Map Revision, to add roads and road names, to change Special Flood Hazard Areas, to change zone designations

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

N

MAP SCALE 1" = 500'

250	0	500	1000 FEET
150	0	150	300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0944H

FIRM

FLOOD INSURANCE RATE MAP

PLACER COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 944 OF 1060

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ROCKLIN, CITY OF	060242	0944	H
ROSEVILLE, CITY OF	060243	0944	H

PRELIMINARY
MARCH 29, 2010

Notice to User: The **Map Number** shown below s hould be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06061C0944H

MAP REVISED

Federal Emergency Management Agency

TOPOGRAPHIC SURVEY

ROSEVILLE SHADOWBROOK PUMP STATION

A PORTION OF
SECTION 35, T.11 N., R.6 E., M.D.B.&M.
PLACER COUNTY, CALIFORNIA
SCALE: 1"=10' MARCH 17, 2015

ANDREGG GEOMATICS
www.andregg.com
800-400-7072

X:\C3D\14679\dwg\14679TPO.dwg

PREPARED AT THE REQUEST OF:
CANDIDO RAMIREZ
HATCH MOTT MACDONALD, LLC

DATE OF GROUND SURVEY:
02/24/2015 & 03/12/2015

DATE OF AERIAL PHOTOGRAPHY:
03/03/2015

BOUNDARY SHOWN HEREON IS APPROXIMATE BASED ON RECORD INFORMATION

HORIZONTAL DATUM:
CALIFORNIA STATE PLANE COORDINATE SYSTEM ZONE II
NAD83(2010)

MEAN COMBINATION FACTOR (CF):
0.9999285907865127DISTANCES SHOWN HEREON ARE GRID DISTANCES
TO CONVERT GRID DISTANCE TO GROUND DISTANCE ... DIVIDE BY THE CF
TO CONVERT GROUND DISTANCE TO GRID DISTANCE ... MULTIPLY BY THE CF

VERTICAL DATUM:
NAVD88 BASED ON BENCH MARK "SAC CORS" & "LNC2 CORS"

LEGEND

△	SURVEY CONTROL POINT	MB	MAIL BOX
●	TREE SYMBOL	MSP	METAL SIGN POST
A	ASPHALT SPOT ELEVATION	PIN	TREE: PINE
AC	AIR–CONDITIONING UNIT	PUE	PUBLIC UTILITY EASEMENT
BFP	BACK FLOW PREVENTION DEVICE	RCP	REINFORCED CONCRETE PIPE
BL	BLOCK WALL	RIS/E	RISER/ELECTRICAL
BRW	BOTTOM OF RETAINING	SDMH	STORM DRAIN MANHOLE
C	CONCRETE SPOT ELEVATION	SL	STREET LIGHT
CIP	CAST IRON PIPE	SSCO	SEWER CLEANOUT
CMP	CORRUGATED METAL PIPE	SSMH	SEWER MANHOLE
CO	CLEANOUT	TBC	TOP BACK OF CURB
D	DIRT SPOT ELEVATION	TOP	TOP OF SLOPE
DEC	TREE: DECIDUOUS	TP	TELEPHONE POLE
DI	DROP INLET	TPAD	TELEPHONE PAD
EDC	EDGE OF CONCRETE	TPB	TELEPHONE PULL BOX
EP	EDGE OF PAVEMENT	TR	TELEPHONE RISER
EPB	ELECTRIC PULL BOX	TRW	TOP OF RETAINING WALL
ETP	ELECTRIC TRANSFORMER PAD	TV	TELEPHONE VAULT
FH	FIRE HYDRANT	VCP	VITRIFIED CLAY PIPE
FL	FLOW LINE	VPB	CABLE PULL BOX
GB	GRADE BREAK	WD	WOOD FENCE
GL	GUTTER FLOW LINE	WF	WIRE FENCE
HB	HOSE BIB	WM	WATER METER
INV	INVERT ELEVATION	WSP	WOOD SIGN POST
IV	IRRIGATION VALVE	WV	WATER VALVE
LIP	LIP OF GUTTER	WVV	WATER VALVE VAULT
		#XXXX	TREE TAG I.D. NUMBER

FLOOD ZONE PER:
PLACER COUNTY FEMA
PRELIMINARY DATASHEET
DATED MARCH 29, 2010
MAP NO. 06061C0944H

Exhibit C:

Shadowbrook Pump Station Topographic Map Showing Floodplain Information and Ineffective Flow Area

Legend:

— — —	Actual Edge of Floodplain at WSE = 154.3 feet
▨	Ineffective Flow Area (d = 2 feet)

Notes:

1. Topographic Mapping by Andregg Geomatics.
2. Annotations shown in blue by Storm Water Consulting, Inc.

Scale:

1" = 10'
(if printed full size at 36"x48")

Storm Water Consulting Inc.

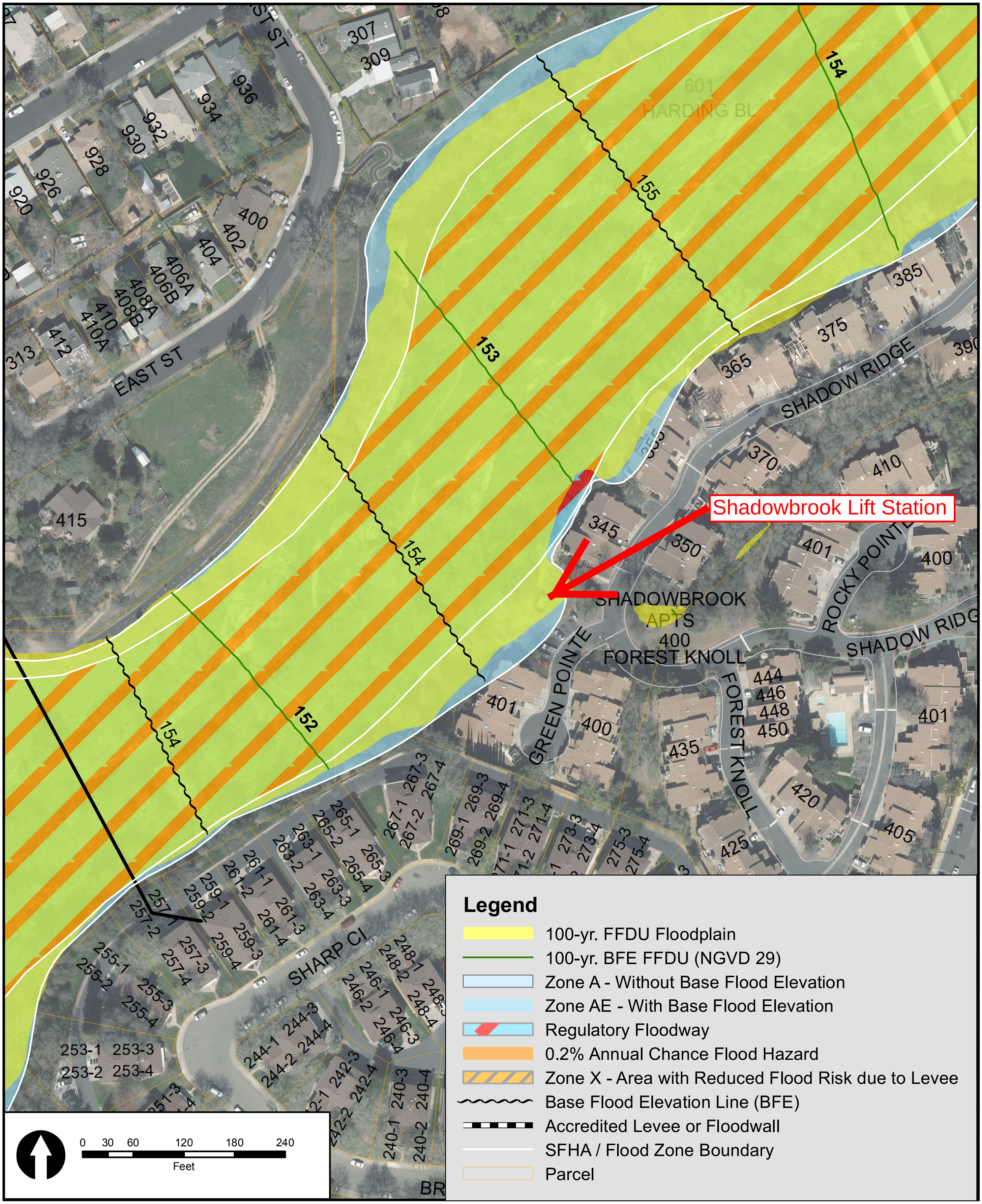
July, 2015
SWC File No. 2015-98

V:\1840\active\184010206\shadowbrook_ps\exhibit\graphics\shadowbrook_ps_map.ai mlm 7-22-2015

CITY OF ROSEVILLE CALIFORNIA

Future Fully Developed Unmitigated (FFDU) Floodplain

Shadowbrook Lift Station



S:\Arcdata\publicworks\Project Folder\Flood\Flood Zone Information\Shadowbrook Lift Station_100 year future.mxd Date Saved: 2/24/2016 10:00:37 AM

EXHIBIT D - City of Roseville FFDU Floodplain Map

APPENDIX F

Noise Assessment

Project:
Shadowbrook Pump Station Rehabilitation Environmental Noise Assessment

October 30, 2015

Prepared for:

ECORP Consulting
2525 Warren Drive
Rocklin, CA 95677
Attn: Mr. Chris Stabenfeldt, AICP

Prepared by:
j.c. brennan & associates, Inc.
Jim Brennan
Jim Brennan
President
Member: Institute of Noise Control Engineering

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

INTRODUCTION

The Shadowbrook Pump Station Rehabilitation Project is located between Dry Creek and the Shadowbrook Apartments, west of the Harding/Lead Hill Boulevard intersection, in the City of Roseville. Figure 1 shows the project location.

The project proposes the following improvements to the existing pump station:

- Install a new fiberglass wet well and replacement of the valve vault within the existing wet well after removal of the existing pumping equipment and piping;
- Install a new standby generator with a sound enclosure, and automatic transfer switch at the lift station;
- Modify the existing lift station masonry walls to maintain a height of 8-feet which encloses the generator;
- Replace the existing pumps, associated equipment, and piping;
- Install on-site emergency storage;
- Install dual force mains between the lift station and the Dry Creek interceptor;
- Abandon the existing force main.

Figure 2 shows the existing and future components of the project.

ENVIRONMENTAL SETTING

Noise Background

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective. Often, someone's music is described as noise by another.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dBA. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dBA, and changes in levels (dBA) correspond closely to human perception of relative loudness.

Figure 1
Shadowbrook Pump Station
Noise Monitoring Sites

j.c. brennan & associates
consultants in acoustics

Figure 2
Shadowbrook Pump Station Rehabilitation Project
Existing and Future Components

Map Date: 10/21/2015
¹ Hatch Mott MacDonald; Photo Source: USGS 2013

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 70

Figure 4. Shadowbrook Lift Station & Force Main Site Plan

2015-020 Shadowbrook Lift Station and Force Main Project

Source: ECORP

j.c. brennan & associates
consultants in acoustics

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels.

There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but may be expressed as dBA, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dBA apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise.

The day/night average level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of maximum noise levels associated with common noise sources.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

Table 1
Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source:Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. November 2009.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dBA per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

A complete listing of acoustical terminology is provided in Appendix A.

EXISTING NOISE ENVIRONMENT IN PROJECT VICINITY

The project area noise environment is a typical suburban environment with the primary noise sources being roadway traffic, distant construction and typical neighborhood activities, including playground activities.

To quantify existing ambient noise levels in the vicinity of the project site, j.c. brennan & associates, Inc., conducted continuous 24-hour noise measurements on the project site, and short-term noise measurements in the vicinity of the site. See Figure 1 for noise measurement locations. The noise level measurements were conducted on July 21st and 22nd, 2015. The noise level measurements were conducted to determine typical existing background noise levels and for comparison to the project noise levels. A summary of the results of the continuous hourly ambient noise survey are shown in Table 2. Appendix B graphically shows the results of the noise measurements.

Equipment used for the noise measurement survey included Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters. The meters were calibrated with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

TABLE 2
SUMMARY OF AMBIENT NOISE MEASUREMENT DATA

SHADOWBROOK PUMP STATION

Site	Location	L_{dn} (dBA)	Average Measured Hourly Noise Levels, dBA					
			Daytime (7am-10pm)			Nighttime (10pm-7am)		
			L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}
Continuous (24-hour) Noise Level Measurements								
A	30 ft northwest of pump station	53	48	45	66	47	45	59
B	Adjacent to Miner’s Ravine Trail	55	50	48	65	48	47	60
Short-term Noise Level Measurements								
1	Southern-most tip of Forest Knoll Loop	N/A	57	56	69	@ 9:42 a.m. (morning)		
		N/A	55	55	61	@ 2:41 p.m. (afternoon)		
2	West intersection of Forest Knoll and Shadow Ridge	N/A	55	53	64	@ 9:09 a.m. (morning)		
		N/A	51	50	58	@ 2:29 p.m. (afternoon)		
3	East intersection of Forest Knoll and Shadow Ridge	N/A	58	57	66	@ 9:29 a.m. (morning)		
		N/A	57	56	63	@ 2:15 p.m. (afternoon)		
Source: j.c. brennan & associates, Inc., 2015.								

REGULATORY FRAMEWORK

Federal

There are no federal regulations related to noise that apply to the Proposed Project.

State

There are no state regulations related to noise that apply to the Proposed Project.

City of Roseville Municipal Code

The following are the applicable noise standards, activities deemed violations, and activities exempt from the noise regulations.

Roseville Municipal Code

The City of Roseville Noise Ordinance, Chapter 9.24 of the Municipal Code establishes noise level criteria for evaluating an offending noise source. The ordinance also establishes limits on stationary noise sources, such as generators, stationary equipment and construction activities. The ordinance also establishes a list of exemptions from the noise level criteria. The following provides the portions of the ordinance that would apply to this project.

> ***9.24.010 Purpose.***
>
> *It is declared to be the policy of the city in its exercise of the police power to prohibit unnecessary, excessive and annoying sound levels from all sources. At certain levels, such sounds become noise and are detrimental to the health and welfare of the citizenry and , in the public interest, are herby systematically proscribed. This chapter is inteded to work in concert with and supplemental Penal Code Section 370 (Public Nuisances) and Section 415 (Disturbing the Peace) and to establish local community standards for noise regulation. (Ord. 3638 s 1 (part), 2001.)*

Section 9.24.100 of the ordinance establishes sound limits for sensitive receptors, as shown below:

> ***9.24.100 Sound limits for sensitive receptors.***
>
> *It is unlawful for any person at any location to create any sound, or to allow the creation of any sound, on property owned, leased, occupied or otherwise controlled by such person, which causes the exterior sound level when measured at the property line of any affected sensitive receptor to exceed the ambient sound level by three dBA or exceed the sound level standards as set forth in Table 3 (Table 1 of Municipal Code), by three dBA, whichever is greater.*

TABLE 3
(TABLE 1 OF MUNICIPAL CODE)
SOUND LEVEL STANDARDS
(FOR NON-TRANSPORTATION OR FIXED SOUND SOURCES)

Sound Level Descriptor	***Daytime*** ***(7:00 a.m. to 10:00 p.m.)***	***Nighttime*** ***(10:00 p.m. to 7:00 a.m.)***
Hourly Leq, dBA	*50*	*45*
Maximum level (Lmax), dBA	*70*	*65*

A. Each of the sound level standards specified in Table 3 (Table 1 of Municipal Code) shall be reduced by five dB for simple tone noises, consisting of speech and music. However, in no case shall the sound level standard be lower than the ambient sound level plus three dB.

B. If the intruding sound source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient sound level can be measured, the sound level measured while the source is in operation shall be compared directly to the sound level standards of Table 3 (Table 1 of Municipal Code). (Ord. 3638 § 1, 2001.)

Section 9.24.030 of the ordinance provides exemptions from the ordinance.

9.24.030 Exceptions.

Sound or noise emanating from the following sources and activities are exempt from the provisions of this title:

A. Sound sources typically associated with residential uses (e.g., children at play, air conditioning and similar equipment, but not including barking dogs);

B. Sound sources associated with property maintenance (e.g., lawn mowers, edgers, blowers, pool pumps, power tools, etc.) provided such activities take place between the hours of 8:00 a.m. and 9:00 p.m.

C. Safety warning and alarm devices, including house and car alarms, and other warning devices that are designed to protect the health, safety and welfare, provided such devices are not negligently maintained or operated;

D. The normal operation of public and private schools typically consisting of classes and other school-sponsored activities;

> *E. Maintenance (e.g., lawn mowers, edgers, aerators, blowers, etc.) of golf courses, provided such activities take place between the hours of 5:00 a.m. and 9:00 p.m. May through September, and 6:00 a.m. and 9:00 p.m. October through April.*
>
> *F. Emergencies involving the execution of duties of duly authorized governmental personnel and others providing emergency response to the general public, including, but not limited to, sworn peace officers, emergency personnel, utility personnel, and the operation of emergency response vehicles and equipment;*
>
> *G. Private construction (e.g., construction, alteration or repair activities) between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday; provided, however, that all construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.*

Section 9.24.140 also provides standards for city activities.

> ***9.24.140 Operational standards for city activities.***
>
> *Notwithstanding any other provisions of the chapter, city operations and activities are not subject to the provisions of the chapter. The city council may, by solution, adopt operations standards for city activities to effectuate the purposes of this chapter.*

Vibration Standards

The City of Roseville Code of Ordinances and Noise Element do not contain standards for evaluating vibration levels. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Vibration criteria developed by Caltrans indicate that the threshold for damage to structures ranges from 2 to 6 in/sec. One-half this minimum threshold or 1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur it notes as 0.1 in/sec p.p.v.

PROJECT IMPACT NOISE AND VIBRATION ASSESSMENT

Pumping System and Lift Station Operations Noise Levels and Mitigation Measures

Pumps will cycle on/off as needed. All pumps associated with the project will be submersible pumps which will be located in wet wells. j.c. brennan & associates, Inc. conducted noise level measurements of the existing submersible pumps on July 28, 2015. Noise level measurements were conducted with pumps operating and with the pumps off. The observations indicated that they were not audible. The noise level measurements indicated that the overall measured noise levels did not change with the pumps running. Pump operations are not expected to be audible when operating. Therefore, this is not a significant impact, and no mitigation is recommended.

Emergency Diesel Generator Noise Levels and Mitigation Measures

The project proposes to install a new standby diesel generator with a sound enclosure. The noise level associated with the standby generator can vary based upon the size (kW) of the generator, and the sound enclosure level. The project proposes a Kohler Power System which includes a 15-30REOZK Generator with a factory sound enclosure. The factory noise level cut-sheet indicates a sound level of 64 dBA at a distance of 7 meters (23-feet). The standby generator would operate under two scenarios as follows:

- The generator would operate during periods when a power failure occurs. Under this scenario, Section 9.24.030 (F) of the City noise ordinance would exempt the operations from the noise level standards.

- The generator would also be exercised, for maintenance purposes, approximately every two weeks for a period of approximately 15 minutes. The nearest residences are approximately 100 feet from the emergency generator. Assuming that the generator is exercised for 15 minutes, the hourly Leq would be 45 dBA, and would comply with the City of Roseville daytime noise level standard. Under this scenario, Section 9.24.030 (E) of the City noise ordinance would exempt the operations from the noise level standards. In addition, it is expected that the new generator will produce noise levels which are less than the existing generator which is currently on-site.

Based upon the analysis, it is recommended that the emergency generator is exercised between the hours of 8:00 a.m. and 5:00 p.m.. It is also recommended that the emergency generator is equipped with a sound enclosure which will reduce noise levels consistent with the specifications described above.

Construction Noise Levels and Mitigation Measures

The construction of the project primarily involves the construction of a new wet well, lift station, and trenching/backfilling new sewer lines a new 6" force main and underground storage pipe. In addition, the existing Miner's Ravine Trail may need to be reconstructed to current requirements.

Construction noise would be the primary contributor to short-term noise impacts from the proposed project. Construction activities associated with the project would result in temporary noise level increases. Any adverse reaction to the noise levels is expected to be minimal based upon time of day, duration and overall noise amplitudes. Maximum noise levels associated with typical construction equipment activities are shown in Table 4 below.

Table 4.
Typical Construction Equipment Maximum Noise Levels

Type of Equipment	Predicted Noise Levels, Lmax dB				Distances to Noise Contours (feet)	
	Noise Level at 50’	Noise Level at 100’	Noise Level at 200’	Noise Level at 400’	70 dB Lmax contour	65 dB Lmax contour
Backhoe	78	72	66	60	126	223
Compactor	83	77	71	65	223	397
Compressor (air)	78	72	66	60	126	223
Concrete Saw	90	84	78	72	500	889
Dozer	82	76	70	64	199	354
Dump Truck	76	70	64	58	100	177
Excavator	81	75	69	63	177	315
Paver	85	79	73	67	283	503
Concrete Mixer	79	73	67	61	141	249
Jackhammer	89	83	77	71	446	792
Pneumatic Tools	85	79	73	67	281	500

Source: Roadway Construction Noise Model User’s Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006. j.c. brennan & associates, Inc. 2015.

As a means of determining the potential noise levels associated with construction activities, j.c. brennan & associates, Inc. utilized the Federal Highway Administration Roadway Noise Construction Model. The model utilized noise level data for each type of noise source and percentage of use during a typical hour. The noise levels associated with construction activities were evaluated for varying distances from the construction areas. Table 5 shows the results of the predicted construction noise levels at distances of 100-feet, 200-feet and 400-feet. This assumes the 4 primary pieces of construction equipment operating simultaneously.

Table 5
Predicted Construction Noise Levels

Equipment	Construction Noise Levels		
	@ 100 feet	@ 200 feet	@ 400 feet
Backhoe	67.6 dBA Leq	61.5 dBA Leq	55.5 dBA Leq
Front End Loader	69.1 dBA Leq	63.1 dBA Leq	57.1 dBA Leq
Concrete Mixer Truck	68.8 dBA Leq	62.8 dBA Leq	56.8 dBA Leq
Dozer	71.7 dBA Leq	65.6 dBA Leq	59.6 dBA Leq
	75.6 dBA Leq	**69.6 dBA Leq**	**63.5 dBA Leq**

Source: Roadway Construction Noise Model User's Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006. j.c. brennan & associates, Inc. 2015.

Sections 9.24.030 (G) and 9.24.140 of the County noise ordinance exempts the project construction noise from the noise level criteria, provided that the construction occurs between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday; provided, however, that all construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.

Mitigation measures shall include the following:

- Construction occurs between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday;

- All construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.

Construction Vibration Impacts and Mitigation Measures

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. As discussed earlier, vibration criteria developed by Caltrans indicate that the threshold for damage to structures ranges from 2 to 6 in/sec. One-half this minimum threshold or 1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur is notes as 0.1 in/sec p.p.v.

Table 6 shows the typical vibration levels produced by construction equipment.

TABLE 6
VIBRATION LEVELS FOR VARYING CONSTRUCTION EQUIPMENT

Type of Equipment	Peak Particle Velocity @ 25 feet	Approximate Velocity Level @ 25 feet
Large Bulldozer	0.089 (inches/second)	87 (VdB)
Loaded Trucks	0.076 (inches/second)	86 (VdB)
Small Bulldozer	0.003 (inches/second)	58 (VdB)
Auger/drill Rigs	0.089 (inches/second)	87 (VdB)
Jackhammer	0.035 (inches/second)	79 (VdB)
Vibratory Hammer	0.070 (inches/second)	85 (VdB)
Vibratory Compactor/roller	0.210 (inches/second)	94 (VdB)

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006

Based upon the distances to the nearest residential receivers, it is not expected that vibration due to construction will result in human annoyance or architectural damage. Therefore, no mitigation is required.

CONCLUSIONS

The project is expected to comply with the City of Roseville Noise Ordinance criteria. The following mitigation measures are provided:

1. Based upon the analysis, it is recommended that the emergency generator is exercised between the hours of 8:00 a.m. and 5:00 p.m.. It is also recommended that the emergency generator is equipped with a sound enclosure which will reduce noise levels consistent with the specifications described earlier in this report;

2. Construction occurs between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday;

3. All construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.

Appendix A

Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B

Shadowbrook Pump Station
24hr Continuous Noise Monitoring - Site A (30 ft from Pump Station)
Tuesday, July 21, 2015 - Wednesday, July 22, 2015

Hour	Leq	Lmax	L50	L90
15:00	44.6	59.9	43.4	41.4
16:00	45.6	64.9	43.9	42.1
17:00	47.5	67.4	45.5	43.3
18:00	50.0	72.4	46.8	45.1
19:00	47.4	62.6	46.0	44.4
20:00	46.8	62.3	46.0	44.4
21:00	47.5	66.8	45.9	43.6
22:00	44.1	53.2	43.8	42.3
23:00	45.2	58.2	44.1	42.3
0:00	46.0	56.6	44.8	42.4
1:00	43.8	55.2	43.0	41.1
2:00	42.7	52.5	41.9	40.0
3:00	49.2	67.5	45.6	41.9
4:00	47.8	60.8	46.4	44.3
5:00	48.0	64.2	46.9	45.2
6:00	47.5	58.7	46.8	45.3
7:00	48.7	69.5	46.4	44.7
8:00	49.0	72.2	45.7	44.1
9:00	48.0	64.8	45.8	43.8
10:00	47.4	62.5	46.0	43.7
11:00	46.7	59.7	45.4	43.3
12:00	46.7	69.8	43.8	41.8
13:00	48.6	67.7	44.7	42.5
14:00	50.0	71.9	45.5	43.2

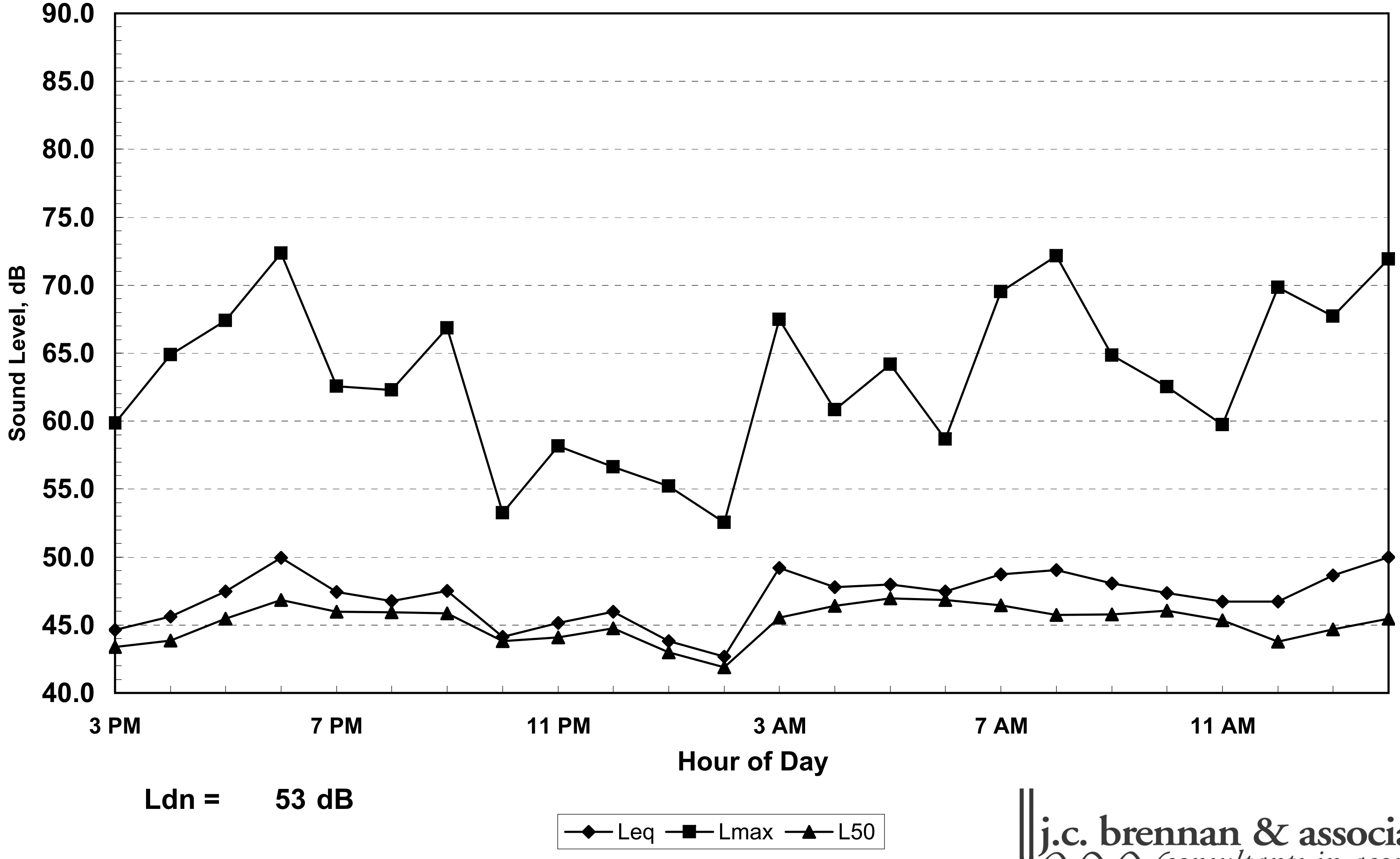
	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	50	45	48	49	43	47
Lmax (Maximum)	72	60	66	67	53	59
L50 (Median)	47	43	45	47	42	45
L90 (Background)	45	41	43	45	40	43

Computed Ldn, dB	53
% Daytime Energy	70%
% Nighttime Energy	30%

j.c. brennan & associates
consultants in acoustics

Appendix B

Shadowbrook Pump Station
24hr Continuous Noise Monitoring - Site A (30 ft from Pump Station)
Tuesday, July 21, 2015 - Wednesday, July 22, 2015



Ldn = 53 dB

j.c. brennan & associates
consultants in acoustics

Appendix B

Shadowbrook Pump Station

24hr Continuous Noise Monitoring - Site B (Miner's Ravine Trail)

Tuesday, July 21, 2015 - Wednesday, July 22, 2015

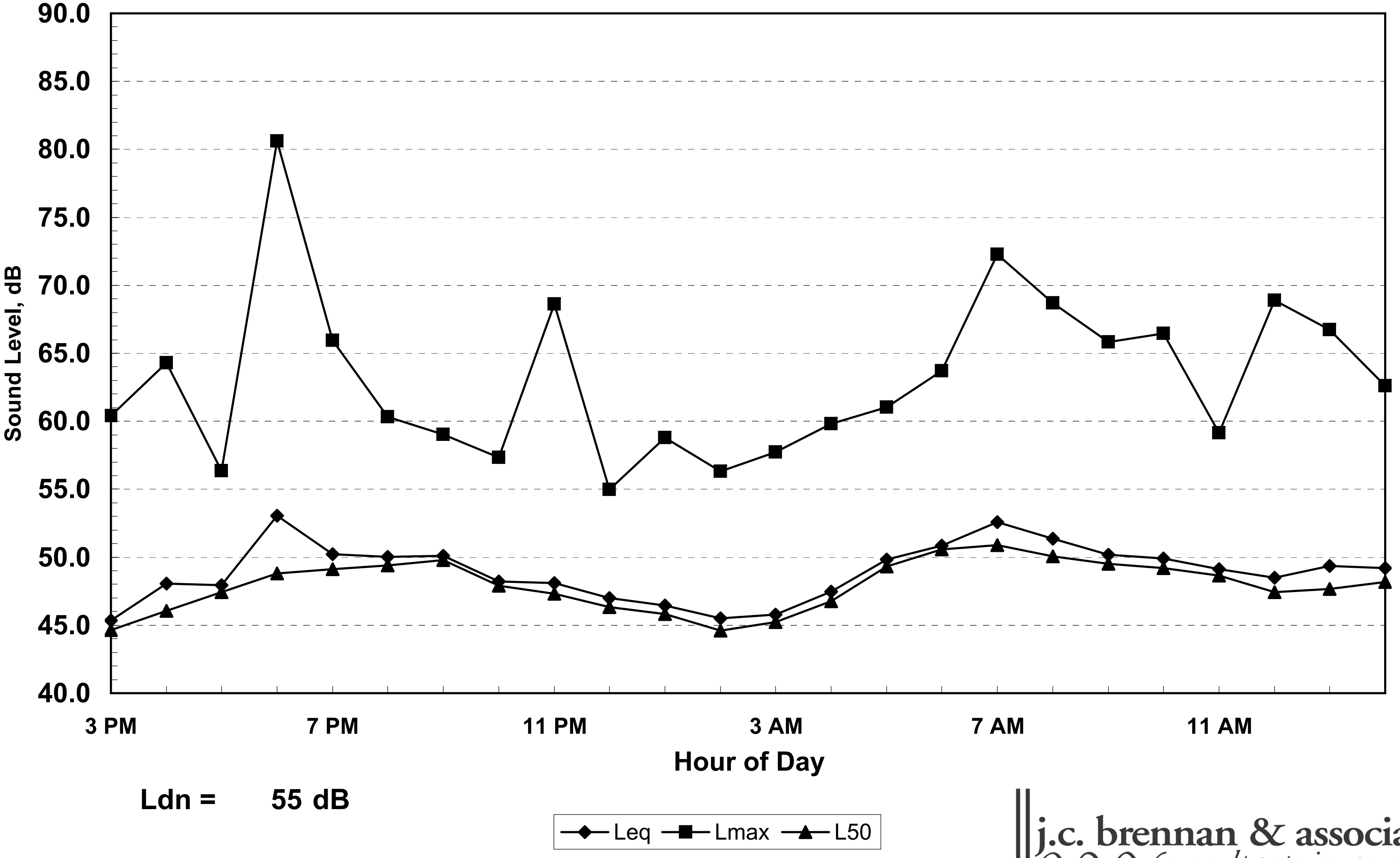
Hour	Leq	Lmax	L50	L90
15:00	45.3	60.4	44.6	42.9
16:00	48.1	64.3	46.1	44.1
17:00	47.9	56.3	47.4	45.5
18:00	53.1	80.6	48.8	47.1
19:00	50.2	65.9	49.1	47.3
20:00	50.0	60.3	49.4	47.8
21:00	50.1	59.0	49.8	48.4
22:00	48.2	57.3	47.9	46.6
23:00	48.1	68.6	47.3	45.9
0:00	47.0	55.0	46.3	44.5
1:00	46.5	58.8	45.8	43.6
2:00	45.5	56.3	44.6	42.9
3:00	45.8	57.7	45.2	43.5
4:00	47.5	59.8	46.8	44.8
5:00	49.8	61.0	49.3	47.4
6:00	50.8	63.7	50.6	49.3
7:00	52.6	72.3	50.9	49.3
8:00	51.4	68.7	50.1	48.5
9:00	50.2	65.8	49.5	48.1
10:00	49.9	66.4	49.2	47.4
11:00	49.1	59.2	48.6	47.2
12:00	48.5	68.9	47.4	45.6
13:00	49.4	66.7	47.7	45.8
14:00	49.2	62.6	48.2	46.3

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	53	45	50	51	45	48
Lmax (Maximum)	81	56	65	69	55	60
L50 (Median)	51	45	48	51	45	47
L90 (Background)	49	43	47	49	43	45

Computed Ldn, dB	55
% Daytime Energy	73%
% Nighttime Energy	27%

Appendix B

Shadowbrook Pump Station
24hr Continuous Noise Monitoring - Site B (Miner's Ravine Trail)
Tuesday, July 21, 2015 - Wednesday, July 22, 2015



Ldn = 55 dB

j.c. brennan & associates
consultants in acoustics

Roadway Construction Noise Model (RCNM),Version 1.0

APPENDIX C

Report dat 11/2/2015
Case Desc Shawdowbrook Pump Station

---- Receptor #1 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Residence:	Residential	48	47	47

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	100	0
Front End Loader	No	40		79.1	100	0
Concrete Mixer Truck	No	40		78.8	100	0
Dozer	No	40		81.7	100	0

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	71.5	67.6	N/A	N/A	N/A	N/A
Front End Loader	73.1	69.1	N/A	N/A	N/A	N/A
Concrete Mixer Truck	72.8	68.8	N/A	N/A	N/A	N/A
Dozer	75.6	71.7	N/A	N/A	N/A	N/A
Total	75.6	75.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Residence:	Residential	48	47	47

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	200	0
Front End Loader	No	40		79.1	200	0
Concrete Mixer Truck	No	40		78.8	200	0
Dozer	No	40		81.7	200	0

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	65.5	61.5	N/A	N/A	N/A	N/A
Front End Loader	67.1	63.1	N/A	N/A	N/A	N/A
Concrete Mixer Truck	66.8	62.8	N/A	N/A	N/A	N/A
Dozer	69.6	65.6	N/A	N/A	N/A	N/A

Total	69.6	69.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Residence	Residential	48	47	47

			Equipment			
Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	400	0
Front End Loader	No	40		79.1	400	0
Concrete Mixer Truck	No	40		78.8	400	0
Dozer	No	40		81.7	400	0

Results

	Calculated (dBA)			Noise Limits (dBA)		
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	59.5	55.5	N/A	N/A	N/A	N/A
Front End Loader	61	57.1	N/A	N/A	N/A	N/A
Concrete Mixer Truck	60.7	56.8	N/A	N/A	N/A	N/A
Dozer	63.6	59.6	N/A	N/A	N/A	N/A
Total	63.6	63.5	N/A	N/A	N/A	N/A

APPENDIX G

AB 52 Consultation

MIWOK United Auburn Indian Community
MAIDU of the Auburn Rancheria

Gene Whitehouse, Chairman
John L. Williams, Vice Chairman
Danny Rey, Secretary
Brenda Adams, Treasurer
Calvin Moman, Council Member

November 23, 2015

City of Roseville Representative
311 Vernon Street
Roseville, CA 95678

RE: AB 52 Notification Request, California Environmental Quality Act Public Resources Code section 21080.3, subd. (b) Request for Formal Notification of Proposed Projects within the United Auburn Indian Community (UAIC) of the Auburn Rancheria's Geographic Area of Traditional and Cultural Affiliation

Dear City of Roseville Representative:

In accordance with Public Resources Code Section 21080.3.1, subd. (b), The United Auburn Indian Community (UAIC) of the Auburn Rancheria, which is traditionally and culturally affiliated with a geographic area within your agency's geographic area of jurisdiction, requests formal notice of and information on proposed projects for which your agency will serve as a lead agency under the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq.

Enclosed with this letter is a copy of a map that depicts the ancestral territory that the UAIC is traditionally and culturally affiliated with. UAIC's traditionally and culturally affiliated geographic area is supported by, and has been developed through, multiple lines of evidence including oral tradition, history, ethnography, geography, linguistic, kinship, biology, archaeology, anthropology, folklore, other relevant information and expert opinion, and Congressional action through the Auburn Indian Restoration Act of 1994 (H.R. 4228 [103rd]).

Pursuant to Public Resources Code section 21080.3.1, subd. (b), and until further notice, we hereby designate the following person as the tribe's lead contact person for purposes of receiving notices of proposed projects from your agency:

Lead Contact:
Gene Whitehouse,
Chairman
10720 Indian Hill Road
Auburn, CA 95603
916-883-2320

RECEIVED
2015 DEC -4 PM 2:49
CITY CLERK DEPARTMENT
ROSEVILLE, CA

Tribal Office 10720 Indian Hill Road Auburn, CA 95603 (530) 883-2390 FAX (530) 883-2380

Copies to:
Jason Camp
Tribal Historic Preservation Officer
10720 Indian Hill Road
Auburn, CA 95603
(530) 883-2320
jcamp@auburnrancheria.com

Marcos Guerrero
Cultural Resources Manager
10720 Indian Hill Road
Auburn, CA 95603
(530) 883-2364
mguerrero@auburnrancheria.com

We request that all notices be sent via certified U.S. Mail with return receipt and that your notices specify a lead contact person for your agency. Following receipt and review of the information your agency provides, within the 30-day period outlined in Public Resources Code section 21080.3.1, subd. (d), the UAIC may request consultation, as defined by Public Resources Code section 21080.3.1, subd. (b), pursuant to Public Resources Code section 21080.3.2 to discuss issues including the type of environmental review to be conducted, project alternatives, significant effects of the project and mitigation measures for any project impacts (direct, indirect and cumulative) a specific project may cause to tribal cultural resources.

For your information, UAIC's policy is to be present during project cultural resource surveys, including initial pedestrian surveys, to identify tribal cultural resources. UAIC's policy is also to be provided all existing cultural resource assessments, including the request for and results of any records search that may have been conducted prior to the initial survey or consultation meeting. Finally, UAIC's general policy is preservation in place and avoidance of tribal cultural resources, and any subsurface testing or data recovery must not occur without first consulting with UAIC and receiving UAIC's written consent.

We recommend that your agency retain this correspondence in your permanent files. If you have any questions or need additional information, please contact Marcos Guerrero, Cultural Resources Manager, at (530) 883-2364 or by email at mguerrero@auburnrancheria.com.

Sincerely,

Gene Whitehouse,
Chairman

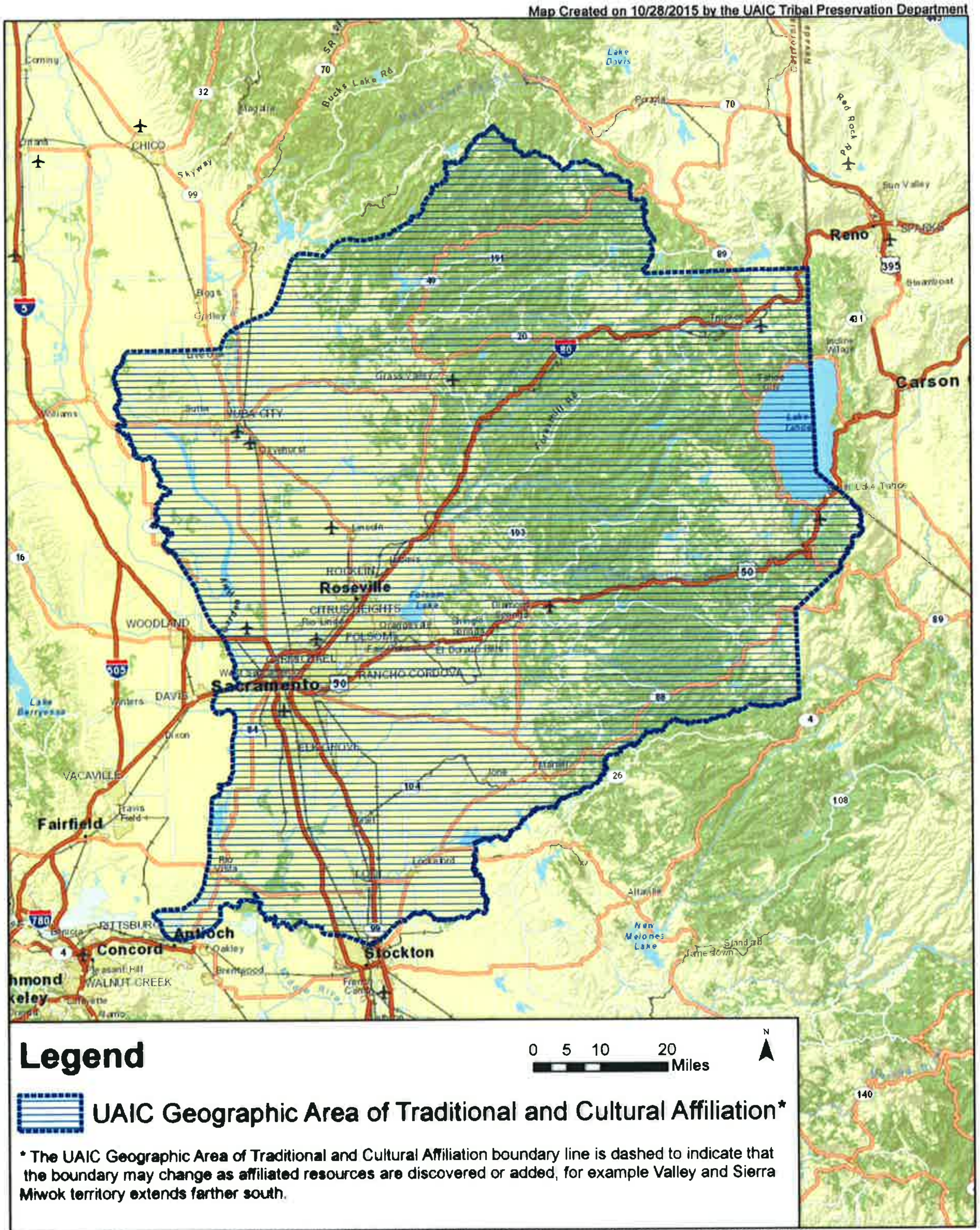
CC: Jason Camp, THPO
Marcos Guerrero, CRM
Cynthia Gomez, NAHC

UAIC Geographic Area of Traditional and Cultural Affiliation

(for the purposes of California AB 52)

This area includes all of Amador, El Dorado, Nevada, Placer, Sacramento, Sutter and Yuba counties as well as portions of Butte, Plumas, San Joaquin, Sierra, Solano, and Yolo counties.

Map Created on 10/28/2015 by the UAIC Tribal Preservation Department



Legend

0 5 10 20 Miles

N

▤ UAIC Geographic Area of Traditional and Cultural Affiliation*

* The UAIC Geographic Area of Traditional and Cultural Affiliation boundary line is dashed to indicate that the boundary may change as affiliated resources are discovered or added, for example Valley and Sierra Miwok territory extends farther south.

This map is no substitute for direct consultation with UAIC prior to considering any proposed project or commencing any archaeological activities in or around sensitive areas.

Note: While we make every effort to identify Tribal Cultural Resources that exist within the UAIC Geographic Area of Traditional and Cultural Affiliation, it is highly probable that there are additional, older sites that we have not yet identified due to restricted access or other reasons or that agricultural or construction activities have distributed burials and cultural materials beyond the previously known boundaries of these sites. Even if these materials are in a disturbed condition, they still retain cultural value to UAIC and should be respected and protected. Because of this, thorough survey with a qualified Native American Monitor to confirm site boundaries and search for unknown sites is critical. This survey should be conducted after consultation with the Tribe and prior to the final determination of the type of environmental document to be used.

CITY OF ROSEVILLE CALIFORNIA

City Manager
311 Vernon Street
Roseville, California 95678-2649

December 17, 2015

Gene Whitehouse, Chairman
United Auburn Indian Community
10720 Indian Hill Road
Auburn, CA 95603

RE: Notice of Opportunity to Consult for the Shadowbrook Lift Station Rehabilitation and Dual Force Main Project in the City of Roseville

Dear Chairman Whitehouse:

The City of Roseville is initiating environmental review under the California Environmental Quality Act (CEQA) for the Shadowbrook Lift Station Rehabilitation and Dual Force Main Project. A project location map and project description are enclosed for your information.

In accordance with Assembly Bill 52 (AB 52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request dated November 23, 2015 to be notified of projects in our jurisdiction that will be reviewed under CEQA. Your name was provided to us as the point of contact for your tribe. We are hereby notifying you of an opportunity to consult with us regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purposes of tribal consultation under AB 52 are to determine, as part of the CEQA review process, whether or not Tribal Cultural Resources are present within the project area, and if so, whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the most appropriate way to avoid or mitigate those impacts.

Mark Morse, Environmental Coordinator, is the City's Lead Agency Contact person for this project. In accordance with Section 21080.3.1(d) of the PRC, you have 30 days from the receipt of this letter to either request or decline consultation in writing for this project from the City's Lead Agency contact. Please send your written response by letter or by email to:

Mark Morse, Environmental Coordinator
311 Vernon Street
Roseville, CA 95678
mmorse@roseville.ca.us

Thank you and we look forward to your response.

Respectfully,

Mark Morse
Environmental Coordinator

cc: Jason Camp, Tribal Historic Preservation Officer
Marcos Guerrero, Cultural Resources Manager

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Gene Whitehouse, Chairman
UAIC Tribal Office
10720 Indian Hill Rd.
Auburn, CA 95603

Shadowbrook lift station

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Michele Bradley
☐ Agent
☑ Addressee

B. Received by *(Printed Name)* Michele Bradley

C. Date of Delivery 12/21

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☑ No

3. Service Type
☑ Certified Mail®
☐ Registered
☐ Insured Mail
☐ Priority Mail Express™
☐ Return Receipt for Merchandise
☐ Collect on Delivery

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service label) 7013 0600 0000 3041 3983

PS Form 3811, July 2013 Domestic Return Receipt