FINAL INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

CARMICHAEL WATER DISTRICT
AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

MARCH 2015

LEAD AGENCY:

Carmichael Water District
7837 Fair Oaks Boulevard
Carmichael, CA 95608
(916) 483-2452

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INTRODUCTION

1.0 INTRODUCTION

1.1 PURPOSE OF STUDY

This Initial Study has been prepared for the Carmichael Water District (CWD or District), as Lead Agency, in accordance with the California Environmental Quality Act (CEQA) of 1970 (as amended), codified in California Public Resources Code Sections 21000 *et seq*., and the State CEQA *Guidelines* in the Code of Regulations, Title 14, Division 6, Chapter 3. The purpose of this Initial Study is to examine the potential environmental effects associated with the construction and operation of the American River Pipeline Conveyance Project (Proposed Project).

The District provides treated water to its customers in its approximately 8-square mile service area. The District services a population of approximately 40,000 people and maintains 12,000 connections to predominantly residential and some commercial customers. Approximately 70 to 80 percent of the District's water is obtained from the American River via appropriative water rights held by the District; these water rights include License 1387 (Application 138), License 8731 (Application 4743), and Permit 7356 (Application 12367). The remaining 20 to 30 percent of the District's water is obtained from groundwater wells owned and operated by CWD.

This Initial Study identifies potentially significant impacts and, where applicable, presents mitigation measures that would reduce all identified environmental impacts to less-than-significant levels. Therefore, as discussed in **Section 4.0**, this Initial Study supports a Mitigated Negative Declaration as defined under CEQA *Guidelines* Section 15070.

1.2 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by the Proposed Project, involving at least one impact requiring mitigation to bring it to a less-than-significant level. Impacts to these resources are evaluated using the checklist included in **Section 3.0**. The Proposed Project was determined to have a less-than-significant impact or no impact without mitigation on unchecked resource areas.

- ☐ Aesthetics
- ☐ Agriculture and Forestry
- ☒ Air Quality
- ☒ Biological Resources
- ☒ Cultural Resources
- ☒ Geology and Soils
- ☐ Greenhouse Gas Emissions
- ☒ Hazards and Hazardous Materials
- ☒ Hydrology and Water Quality
- ☐ Land Use and Planning
- ☐ Mineral Resources
- ☒ Noise
- ☐ Population and Housing
- ☐ Public Services
- ☐ Recreation
- ☒ Transportation and Traffic
- ☐ Utility and Service Systems

1.3 EVALUATION TERMINOLOGY

The following terminology is used to describe the levels of significance for impacts identified for each resource area discussed in **Section 3.0**.

A conclusion of ***no impact*** is used when it is determined the Proposed Project would not adversely impact the resource area under evaluation.

A conclusion of ***less-than-significant impact*** is used when it is determined the Proposed Project's adverse impacts to a resource area would not exceed established thresholds of significance.

A conclusion of ***less-than-significant impact with mitigation*** is used when it is determined that mitigation measures would be required to reduce the Proposed Project's adverse impacts below established thresholds of significance.

1.4 ORGANIZATION OF THE INITIAL STUDY

This document is organized into the following sections:

Section 1.0 – Introduction: Describes the purpose, contents, and organization of the document.

Section 2.0 – Project Description: Includes a detailed description of the Proposed Project.

Section 3.0 – Environmental Impact Analysis: Contains the Environmental Checklist from CEQA *Guidelines* Appendix G with a discussion of potential environmental effects associated with the Proposed Project. Mitigation measures, if necessary, are noted following each impact discussion.

Section 4.0 – Significance Determination: Identifies the determination of whether impacts associated with development of the Proposed Project are significant, and what, if any, additional environmental documentation may be required.

Section 5.0 – List of Preparers

Section 6.0 – References

Appendices – Contains information to supplement **Section 2.0** and **Section 3.0**.

1.5 PUBLIC PARTICIPATION PROCESS

Public review of the Proposed Project was initiated with release of a Notice of Intent (NOI) on February 6, 2015, which is included as **Appendix D**. The Initial Study was circulated for a 31-day public comment period that closed on March 9, 2015. This Final Initial Study includes comments received during this comment period in **Appendix E** and responses to those comments in **Appendix F**. In addition, the final Mitigation, Monitoring, and Reporting Plan (MMRP) is included as **Appendix G**.

Corrections made to the Initial Study as a result of the public comment period include: corrections that will improve the clarity of writing, grammatical errors, and consistency errors. Additional corrections or clarifications have been made based on requests by commenters. Text that has been deleted from the Initial Study will be marked as a strikeout (~~deleted text~~), while new text will be labeled with an underline (new text).

SECTION 2.0

PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

This section provides a description of the Proposed Project that serves as the basis for the assessment of potential environmental consequences in **Section 3.0**.

2.2 PROJECT LOCATION

The Carmichael Water District (CWD or District) American River Pipeline Conveyance Project (Proposed Project) involves implementation of various improvements at the Aerojet Groundwater Extraction and Treatment LB (GET LB) facility outlet channel (referred to as "unnamed drainage"), pipeline construction including a new American River crossing, stream restoration and culvert upgrades, and removal of a currently exposed pipeline in the American River (Proposed Project). The project site is located in the community of Carmichael, Sacramento County (County), California (**Figure 1**) on the north side of the river, and the City of Rancho Cordova on the south side of the river.

2.3 PROJECT BACKGROUND

Implementation of the Proposed Project would provide treated water to Golden State Water Company (GSWC) to replace groundwater affected by contamination. Aerojet will provide 5,000 acre-feet (af) of groundwater per year to GSWC, which has been identified as a water supply to replace wells shut down due to contamination.[1] Aerojet pumps the groundwater from its existing wellfields in Rancho Cordova and Fair Oaks, treats the water at an existing groundwater treatment plant, and releases it into Buffalo Creek upstream of its confluence with the American River. The facilities, known as Groundwater Extraction and Treatment facilities, or GET facilities, operate under U.S. Environmental Protection Agency (USEPA) oversight and meet National Pollutant Discharge Elimination System (NPDES) treatment standards.[2] The American River is used to convey treated water downstream. The State Water Resources Control Board (SWRCB), in a draft order, recognized that

> "[t]o the extent that the groundwater Aerojet pumps, treats, and discharges into the American River is not contributory to the surface stream, and would not be contributory under natural conditions, this water is foreign and developed because it would not have reached the stream otherwise and is imported by artificial means.
>
> A person or entity that by his or her own efforts makes such water available is entitled to use it, so long as the use does not infringe on the prior rights of others. Water Code section 7075 allows the use of a natural stream channel as a conduit for delivering water to another location downstream."[3]

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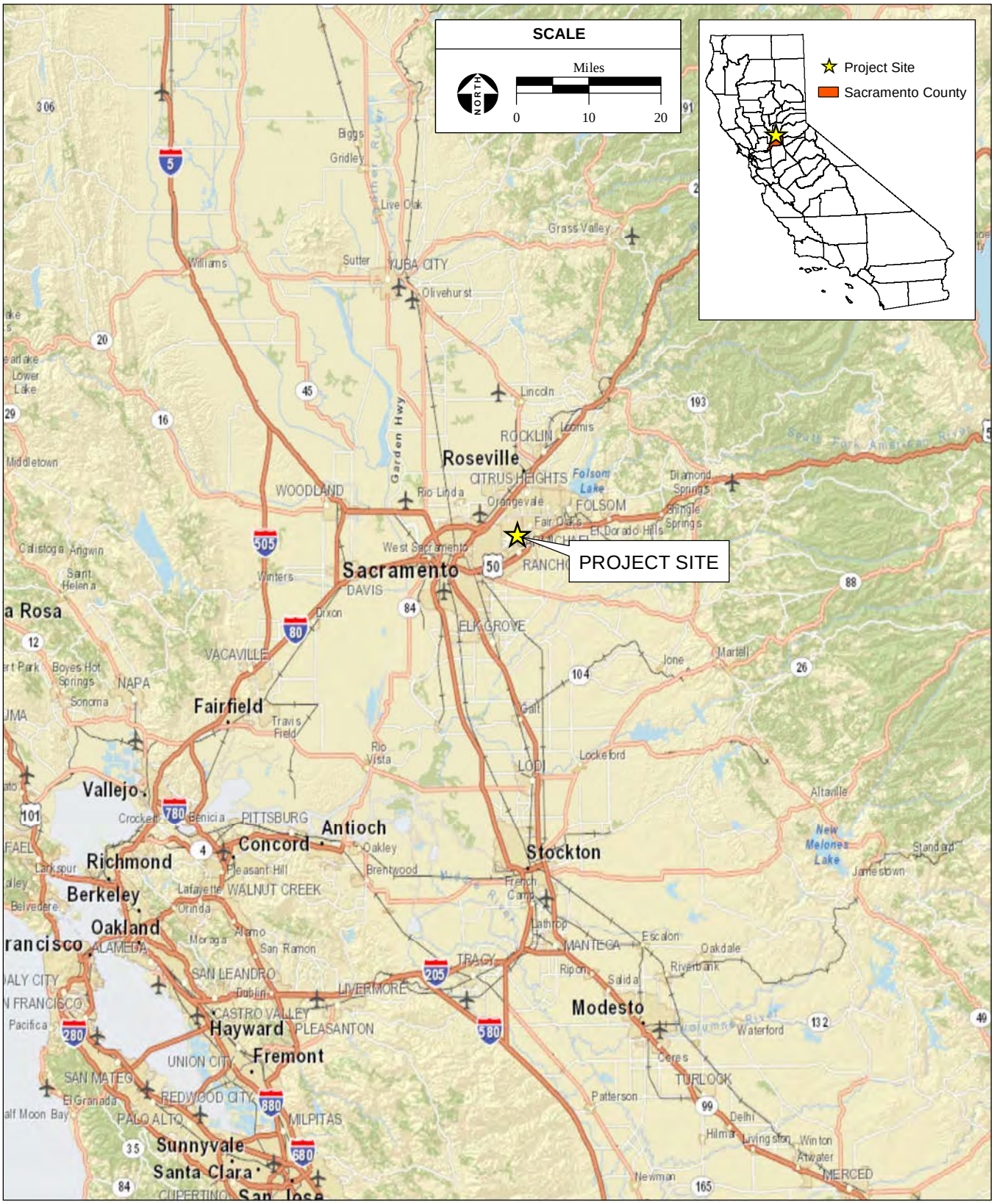
[1] Section 2.2.3.1 of the Master Settlement Agreement and Release entered between the American States Water Company and Southern California Water Company and Aerojet General Corporation and Cordova Chemical Company dated October 12, 2004.

[2] *See* Fact Sheet, NPDES Permit No. CA0083861 (Order R5-2014-0126) (Oct. 10, 2014), pp. F-4 to F-5.

[3] State Water Resources Control Board, Draft Order Denying Petition to Revise the Declaration of Fully Appropriated Streams to Allow Processing of Applications to Appropriate Treated Groundwater Discharged into the Lower American River, at *15 (May 12, 2003).



SOURCE: ESRI Server, 2011; AES, 2014

Figure 1
Regional Location

This was later confirmed by SWRCB staff in a 2007 letter, which stated that

> [R]e-diversion of an equivalent amount of water to that which originated as percolating groundwater which, under natural conditions, would not reach or recharge the stream is considered foreign and developed water. A person or entity that by his or her own efforts makes such water available is entitled to use it, so long as the use does not infringe on the prior rights of others. Water Code section 7075 allows the use of a natural stream channel as a conduit for delivering water to another location downstream.[4]

Aerojet has previously transferred a portion of the GET water to the County of Sacramento under a 2010 agreement, which transfer was recognized to be effective.[5] More recently, Aerojet temporarily transferred GET water to CWD to meet the District's need during 2014 drought conditions. CWD will collect the water on behalf of GSWC at its existing water intake facility to the Bajamont water treatment plant (WTP) (located at the same facility as the Aerojet GET LB facility). The groundwater, treated to SWRCB Division of Drinking Water standards, will then be transported through a proposed new water pipeline beneath the American River to existing GSWC infrastructure and provided to customers within the GSWC service area. The pipeline will also have the ability to convey water back from GSWC to CWD during severe drought conditions.

Because the new pipeline that will be constructed under the American River and will need to pass through an eroded river bank beside the existing Aerojet GET LB facility and Bajamont WTP outlet channel, improvements to the river bank will be necessary. This outlet channel is locally referred to as "Good Bly Ravine" and will be referred to as the unnamed drainage in this Initial Study. In addition to erosion, the river bank contains old and abandoned water-related structures that must be removed to make room for the new pipeline. The Aerojet GET LB facility currently discharges treated water into the unnamed drainage that drains to ~~flows into~~ the American River; this drainage begins upstream from the GET LB facility discharge point as a daylighted stream, then enters an existing undersized culvert that drops toward the American River. Significant undercutting has occurred where the culvert ends, which has created a drop of approximately 12 feet over a distance of 50 feet (24 percent slope) at the confluence of the drainage with the American River (**Figure 2**, **Photo 1**).

In addition, an existing water pipeline across the American River was installed in the 1950s to bring water from the District's Ranney collectors and deliver it for use within CWD's service area. The existing pipeline was trenched below river grade at the time of initial construction. Over the years, natural scouring of the river bottom has gradually exposed the pipeline, creating a potential safety hazard for those using the river and presenting a liability for the District (**Figure 2**, **Photo 2**).

2.4 PROJECT OBJECTIVES

The District has identified the following objectives for the Proposed Project:

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[4] Letter from Katherine Mrowka, Chief, Watershed Unit 3, to Joyce Horizumi, Sacramento County Water Agency (Mar. 13, 2007).

[5] Final Environmental Impact Report/Environmental Impact Statement, Vol. I, Ch. 3 (Rio del Oro Specific Plan Project, Master Responses), at 3-1 (June 24, 2010), available at http://www.cityofranchocordova.org/ftp/large_docs/Public%20FEIR-FEIS_Vol%20I.pdf.

PHOTO 1: Undercutting at the confluence of the unnamed stream and American River.

PHOTO 2: Exposed pipeline creating a safety hazard across the American River.

PHOTO 3: Abandoned concrete pads on the north bank of the American River.

PHOTO 4: Rossmoor Bar area on south bank of the American River.

SOURCE: AES, 2014

Figure 2
Site Photographs

- Provide treated water to GSWC to replace water lost due to contamination by constructing a new American River pipeline crossing;
- Improve safety on the American River by removing an existing, partially exposed pipeline in the bed of the American River;
- Protect public utilities and private property adjacent to the Bajamont WTP;
- Enhance connectivity between the American River and the unnamed drainage;
- Improve the habitat within the unnamed drainage and north bank of the American River through implementation of stream restoration techniques; and
- Provide improved drought water supply feasibility for the District.

2.5 PROJECT DESCRIPTION

2.5.1 PROJECT COMPONENTS

The Proposed Project consists of: 1) new pipeline construction beneath the American River from Carmichael to Rancho Cordova; 2) old pipeline removal from the American River; 3) culvert replacement and bank stabilization at the unnamed drainage; and 4) stream restoration along the north and south banks of the American River. The project components are shown on **Figure 3** and the Construction Plans (90 Percent Submittal) are included as **Appendix A** (Kennedy Jenks, 2014).

New Pipeline Construction

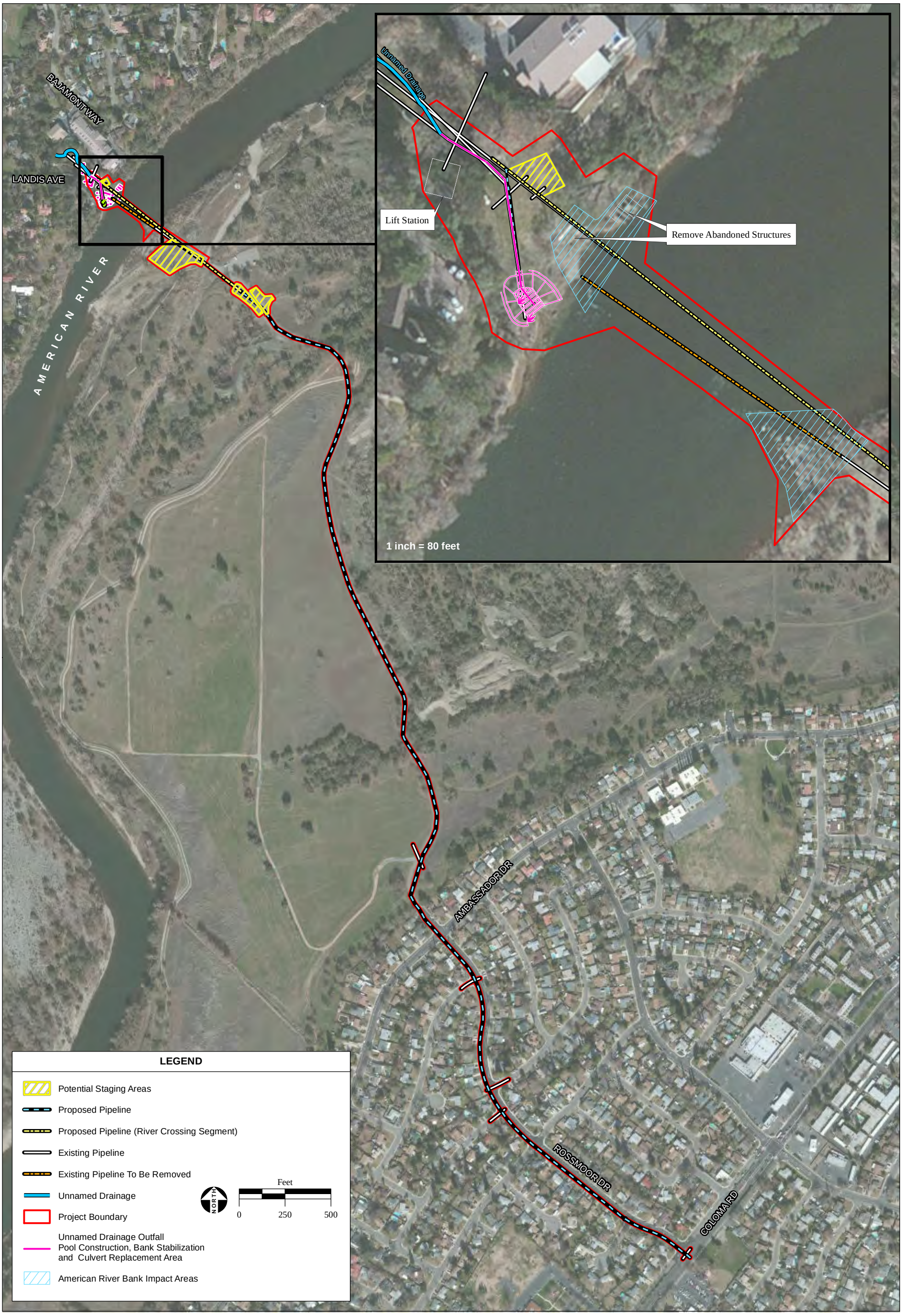
A 24- to 30-inch diameter pipeline will be installed from the District's Bajamont WTP to an existing GSWC water main located along Coloma Road near Rossmoor Drive, as shown on **Figure 3**. The pipeline on the north side of the American River will tie into existing infrastructure at the Bajamont WTP. The pipeline will terminate at Rossmoor Drive in Ranch Cordova and will tie in directly to an existing water main in the GSWC distribution system.

Approximately 1,060 feet of the pipeline will be installed underneath the American River using horizontal directional drilling (HDD) techniques to a depth of up to 85 feet, as shown on **Figure 4**. This portion of the pipeline, called the American River crossing segment, will be made of 30-inch diameter high density polyethylene (HDPE) pipe. The remaining pipeline alignment, which will follow Rossmoor Drive for 6,143 feet, will be a 24-inch diameter ductile iron pipe installed using open cut trenching with a depth of cover of approximately 5 feet (**Appendix A**). The increased pipeline diameter is to address the greater wall thickness of the HDPE pipe and provide an equivalent capacity as the 24-inch diameter ductile iron pipe.

There are no official levees along the pipeline route.

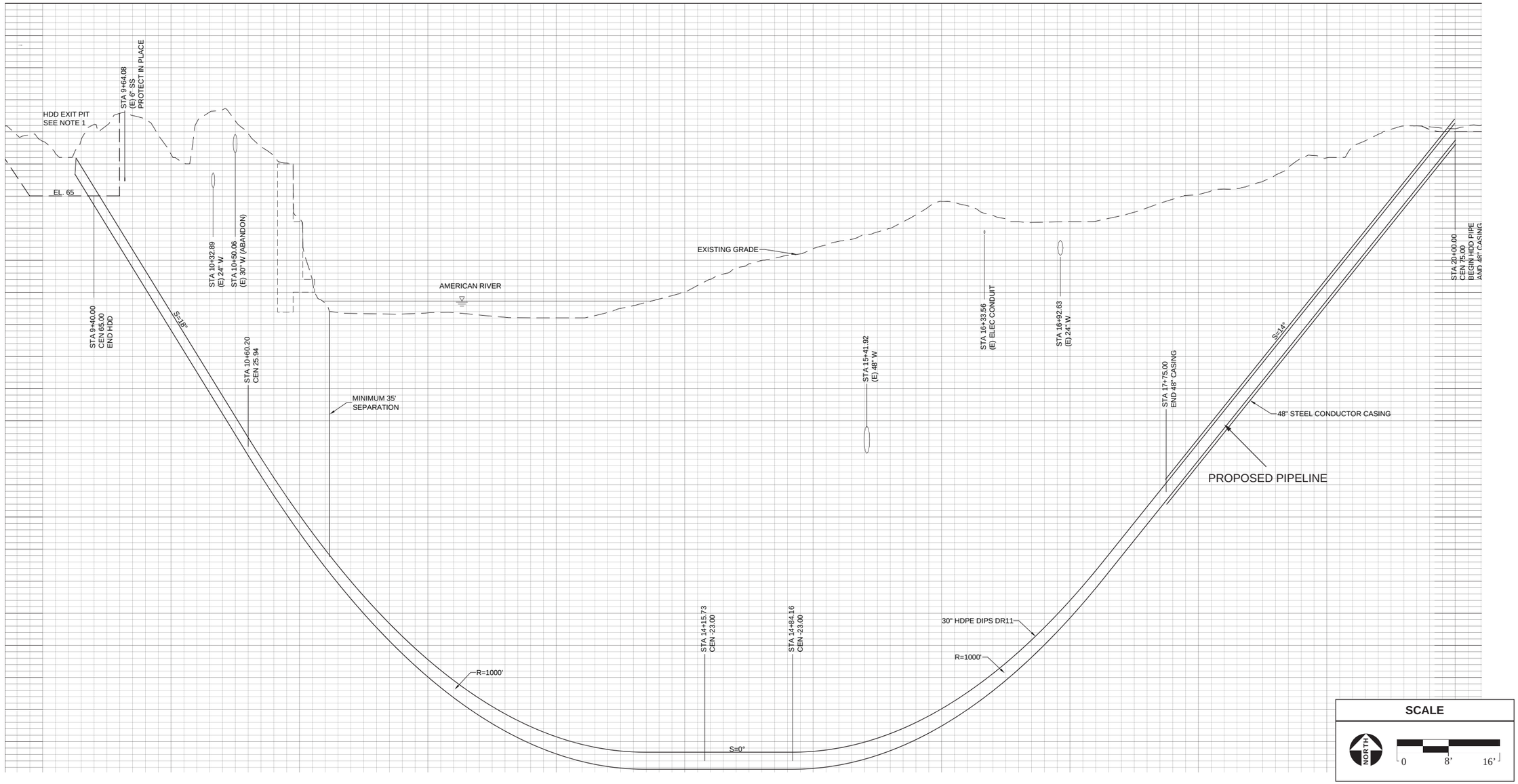
Old Pipeline Removal

As discussed in **Section 2.3**, a water pipeline was installed across the American River in the 1950s to bring water from the District's Ranney collectors and deliver it for use within CWD's service area. This pipeline is now abandoned. Although the existing pipeline was trenched below river grade at the time of initial construction, natural scouring of the river bottom has gradually exposed the pipeline, creating a potential safety hazard for those using the river and presenting a liability for the District. Therefore, the 300 feet of exposed and buried 33-inch diameter pipeline and associated concrete and steel structures will be removed from the American River.



SOURCE: Kennedy-Jenks, 8/2014; DigitalGlobe aerial photograph, 2/2/2012; AES, 2014

Figure 3
Project Overview



SOURCE: Kennedy-Jenks, 8/2014; AES, 2014

Figure 4
Cross Section of American River Crossing Segment

Culvert Replacement

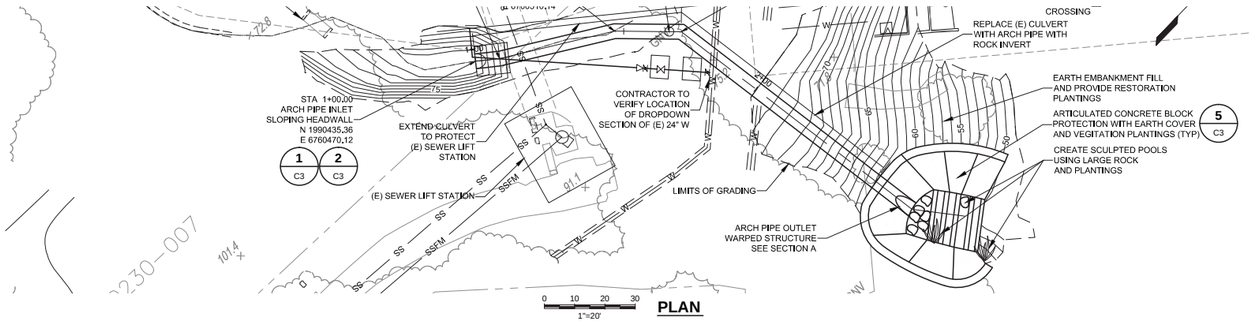
The Aerojet GET LB facility discharges treated groundwater into the Good Bly Ravine, located ~~a drainage that flows~~ immediately adjacent to the District's Bajamont WTP to the American River. The unnamed drainage enters a 24-inch diameter culvert, which is undersized and cannot convey storm flows. Overtopping of the culvert occurs during winter storm events, and significant undercutting occurs at the outlet of the culvert where it approaches the normal low flow area of the American River. All of these conditions lead to erosion and channel scouring that puts public utilities (trenched pipelines, sewer lift station, and water pipelines) at risk. As part of the Proposed Project, the existing culvert will be replaced with a bottomless 47 inch by 60 inch arch culvert (**Appendix A**). In order to protect existing facilities, the culvert will be approximately 150 feet long, extending approximately 70 feet beyond the location of the existing undersized culvert, as shown on **Figure 5**. Lengthening the culvert also allows the slope of the culvert to be maintained at its current slope while still lowering the outfall at the American River to reduce the drop, which will reduce the water velocity and erosion potential of the discharged water. The maintenance of the current slope in combination with the lower drop at the American River confluence will also increase habitat connectivity from the American River to the unnamed drainage. The bottomless culvert will be lined with a pre-fabricated modular stability system and will contain rocks and gravel to provide more natural habitat for wildlife. The bottomless culvert will be sized so that it can convey storm flows and the GET LB outflows without backing up and causing channel instability and incision.

In order to remediate the steep undercutting that has occurred at the outlet of the unnamed drainage, stair-stepping pools will be constructed that allow a gradual transition from the entrance of the new culvert to the low flow bank of the American River. The first pool will be the longest and the deepest at approximately 14 feet long by 18 inches deep, allowing water flowing out of the culvert to pond and dissipate energy, thereby reducing its erosion potential. Water will then flow into a series of smaller, shallower pools that are approximately 7 to 10 feet long by 10 to 12 inches deep, as detailed in **Appendix A**. This design, which mimics natural river geomorphology, will also provide holding habitat for fish in the deeper (18 inch deep) pools. Erosion will be minimized through the use of construction materials such as large rocks and pre-fabricated articulated concrete blocks. The area will be partially stabilized with engineered fill, and replanted with native vegetation to help prevent erosion, even at high flows in the American River when the entire area may be inundated.

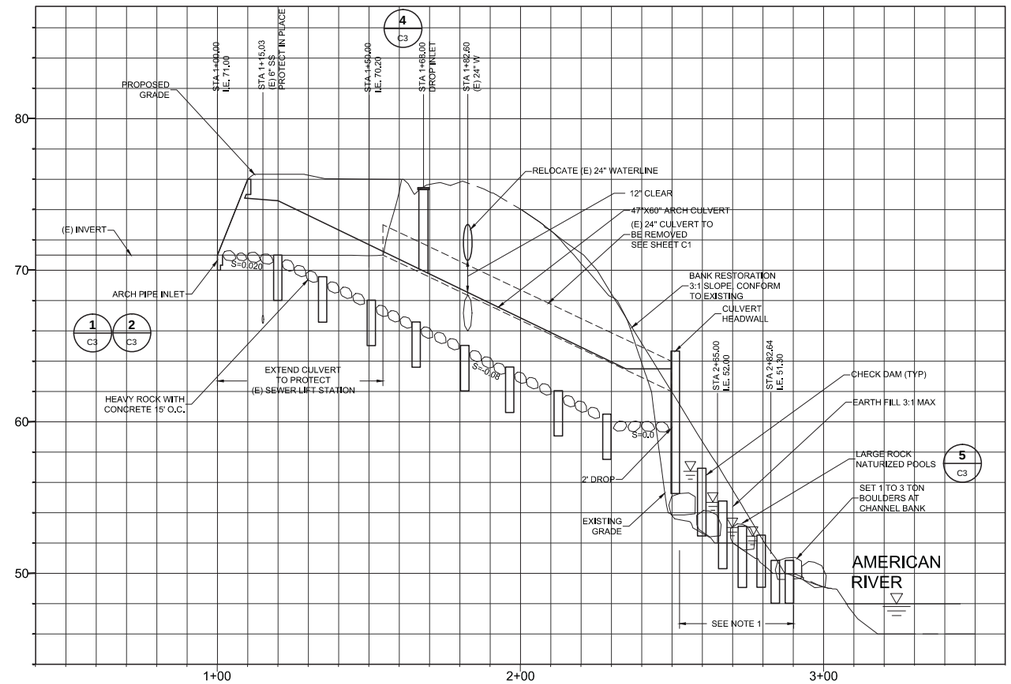
Stream Restoration

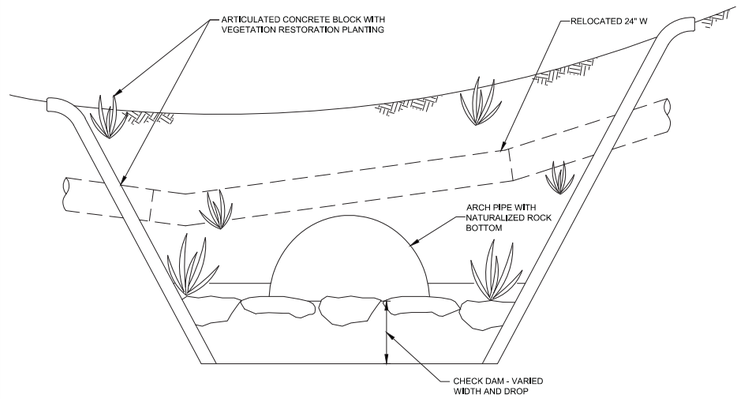
The general goals of the stream restoration are to: 1) increase stability of the eroding northern river bank by upgrading and resizing the existing culvert at the unnamed drainage; 2) reduce instream water temperature by improving the multi-story shade and cover along the northern bank of the American River; 3) plant native vegetation and increase wildlife habitat values along the northern and southern banks of the American River; and 4) discourage the growth of the invasive species such as English ivy, periwinkle, Italian lords and ladies, star thistle, and tree of heaven which are in the area today and will be removed and replaced with native vegetation.

Restoration activities recommended for the North Bank Restoration Area include: the removal of the existing culvert, installation of a bottomless culvert, grading of the riverbank to reduce erosion, removing the abandoned steel and concrete utility pads, and planting of native vegetation.



PLAN





SECTION A

NOTES:
1. STEPPED PONDS RANGING IN SIZE AND DROP.

SCALE

NORTH

0 25' 50'

SOURCE: Kennedy-Jenks, 8/2014; AES, 2014

Figure 5
North Bank Culvert Replacement

There are two unused steel and concrete vaults on the bank of the American River at the edge of the CWD property that create a steep drop-off and cliff down to the American River (**Figure 2**, **Photo 3**). These will be demolished and removed to below the bank elevation as part of the Proposed Project. The deep foundations of the existing structures will be abandoned in place to maintain bank stability, and the bank will be re-contoured to a natural river bank slope ~~at approximately 3:1 slope~~to match the surrounding river bank. Following the replacement of the culvert in the unnamed drainage, invasive species along the lower banks of these slopes will be removed and native vegetation will be planted. The native shrubs and grass seed mix would provide habitat and bank stabilization benefits.

2.5.2 CONSTRUCTION ACTIVITIES

Project components would be designed and constructed in accordance with applicable codes and industry recognized standards, including provisions of the American Water Works Association (AWWA) Standards, Uniform Plumbing Code, California State Building Code (CBC), and the International Building Code (IBC). Components of the Proposed Project would require general construction activities, and would include grading, trenching, demolition, and import and export of materials. Construction of project components would occur periodically over the course of one year and would not occur simultaneously.

Construction Equipment

Energy efficient construction equipment would be utilized to the extent feasible. The following equipment may be utilized occasionally during construction of the Proposed Project:

- Front-end loader
- Crane
- Water truck
- Air compressor
- Flat-back delivery truck
- Pavement saw
- Jack hammer
- Excavator
- HDD equipment and drilling fluid pumps
- Vactor truck
- HDD joint welding machine
- Compaction equipment
- Dump truck
- Bulldozers
- Trencher
- Trench shields
- Concrete trucks and pump
- Sweepers
- Backhoe/Loader
- Welding truck

2.5.3 OPERATION AND MAINTENANCE ACTIVITIES

Periodic maintenance of the culvert and pipeline may be required after the Proposed Project is operational. District staff would inspect components of the Proposed Project regularly and replace equipment that reaches the end of its lifetime or fails during use.

2.5.4 SCHEDULE

Pipeline Construction – ductile iron section – Spring/Summer 2015
Pipeline Construction – American River crossing segment – Summer 2015
North Bank Restoration – remove concrete vaults and replace culvert – Fall 2015/Spring 2016
Remove Old Pipeline – Fall 2016

2.6 REGULATORY REQUIREMENTS, PERMITS, AND APPROVALS

As part of implementation of the Proposed Project, the following permits and approvals may be necessary:

CARMICHAEL WATER DISTRICT

- Adoption of this Initial Study/Mitigated Negative Declaration (IS/MND) under the requirements of the California Environmental Quality Act (CEQA).
- Adoption of a Mitigation Monitoring and Reporting Plan that incorporates the mitigation measures identified in this document.

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

- RWQCB Clean Water Act (CWA) Section 401 Water Quality Certification.
- RWQCB CWA Section 402 Construction NPDES Storm Water Pollution Prevention Plan (SWPPP).

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

- Issuance of a Streambed Alteration Agreement pursuant to Section 1602 of the California Fish and Game Code.

CENTRAL VALLEY FLOOD PROTECTION BOARD

- Issuance of a Central Valley Flood Protection Board Encroachment Permit Form 3615

UNITED STATES ARMY CORP OF ENGINEERS

- Issuance of a permit pursuant to CWA Section 404

CALIFORNIA STATE LANDS COMMISSION

- Issuance of a California State Lands Commission (CSLC) Lease/ Permit

STATE WATER RESOURCES CONTROL BOARD – DIVISION OF DRINKING WATER

- Issuance of a Water Supply Permit Amendment to both CWD and GSWC

SECTION 3.0

ENVIRONMENTAL ANALYSIS (CHECKLIST)

3.0 ENVIRONMENTAL ANALYSIS (CHECKLIST)

3.1 INTRODUCTION TO ENVIRONMENTAL ANALYSIS

Pursuant to California Environmental Quality Act (CEQA) *Guidelines* Section 15063, an initial study should provide the lead agency with sufficient information to determine whether to prepare an environmental impact report (EIR) or negative declaration (ND) for a proposed project. The CEQA *Guidelines* state that an initial study may identify environmental impacts by use of a checklist, matrix, or other method, provided that conclusions are briefly explained and supported by relevant evidence. If it is determined that a particular physical impact to the environment could occur, then the checklist must indicate whether the impact is Potentially Significant, Less than Significant with Mitigation, or Less than Significant. Findings of No Impact for issues that can be demonstrated not to apply to a proposed project do not require further discussion. Environmental resource areas and potential impacts are discussed and summarized in a checklist format.

3.2 AESTHETICS

3.2.1 SETTING

Sacramento County (County) has numerous scenic resources, including natural and cultural assets. The project site includes areas near the District's Bajamont Water Treatment Plant (WTP), an unnamed stream, a segment of the American River, the Rossmoor Bar area of the American River Parkway, and a stretch of Rossmoor Drive in the City of Rancho Cordova. Open space areas in the vicinity include the American River and the American River Parkway.

The Sacramento County General Plan of 2005 – 2030 (General Plan) has designated numerous scenic corridors throughout the County, including Garden Highway and roads that run on top of levees. In addition, the General Plan protects both the Sacramento and American Rivers within the County with corridors extending 500 feet to each side of the river, as measured from the center of the channel, or by a minimum corridor width of 300 feet from the edge of the river (Sacramento County, 2011). There are no State- or County- designated scenic highways in the vicinity of the project site (Caltrans, 2014). Therefore, the project site is not located within or near a designated scenic road or highway, but it is located in a County-designated sensitive viewshed.

3.2.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

AESTHETICS	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
e) Increase the amount of shading on public open space (e.g. parks, plazas, and/or school yards)?	☐	☐	☒	☐

Questions A, C, and E

The American River Pipeline Conveyance Project (Proposed Project) would involve several project components, including: 1) new water pipeline construction beneath the American River; 2) removal of the abandoned pipeline that is exposed and partially buried beneath the American River; 3) culvert replacement and bank stabilization at the unnamed stream; and 4) stream restoration components along the north and south banks of the American River. During construction of the Proposed Project, there would be a temporary, short-term adverse effect on the scenic vista within the American River and American River Parkway as construction equipment would be present within the designated scenic corridor. However, the long-term effect of the Proposed Project would be an improvement in the viewsheds at the project site and at the American River Parkway. The existing condition of the project site includes abandoned steel and concrete pads embedded into the river bank, steep drop-offs created by erosion and undercutting, and a partially exposed pipeline crossing the American River. Following construction of the Proposed Project, these structures will be removed and riparian vegetation will be replanted to create native habitat in the area and thus an overall benefit to viewsheds. The project components would not create a significant barrier to views, as the only structures that would be built are trenched pipelines. Some shading within the American River Parkway would occur, as it is one of the goals of the Proposed Project to plant trees and riparian vegetation to increase habitat value and shading of the unnamed tributary and American River. **Less than Significant.**

Question B and D

None of the State- or County-designated scenic highways in Sacramento County are in the vicinity of the project site. No new sources of light or glare would be created as a result of the Proposed Project. **No Impact.**

Cumulative Impacts

The Proposed Project would result in an improvement to the visual character of the project site and surroundings, as there are several abandoned structures and a pipeline that would be removed under the Proposed Project. Therefore, the Proposed Project would not contribute to cumulatively significant impacts associated with aesthetic resources. **Less than Significant.**

3.2.3 MITIGATION MEASURES

None required.

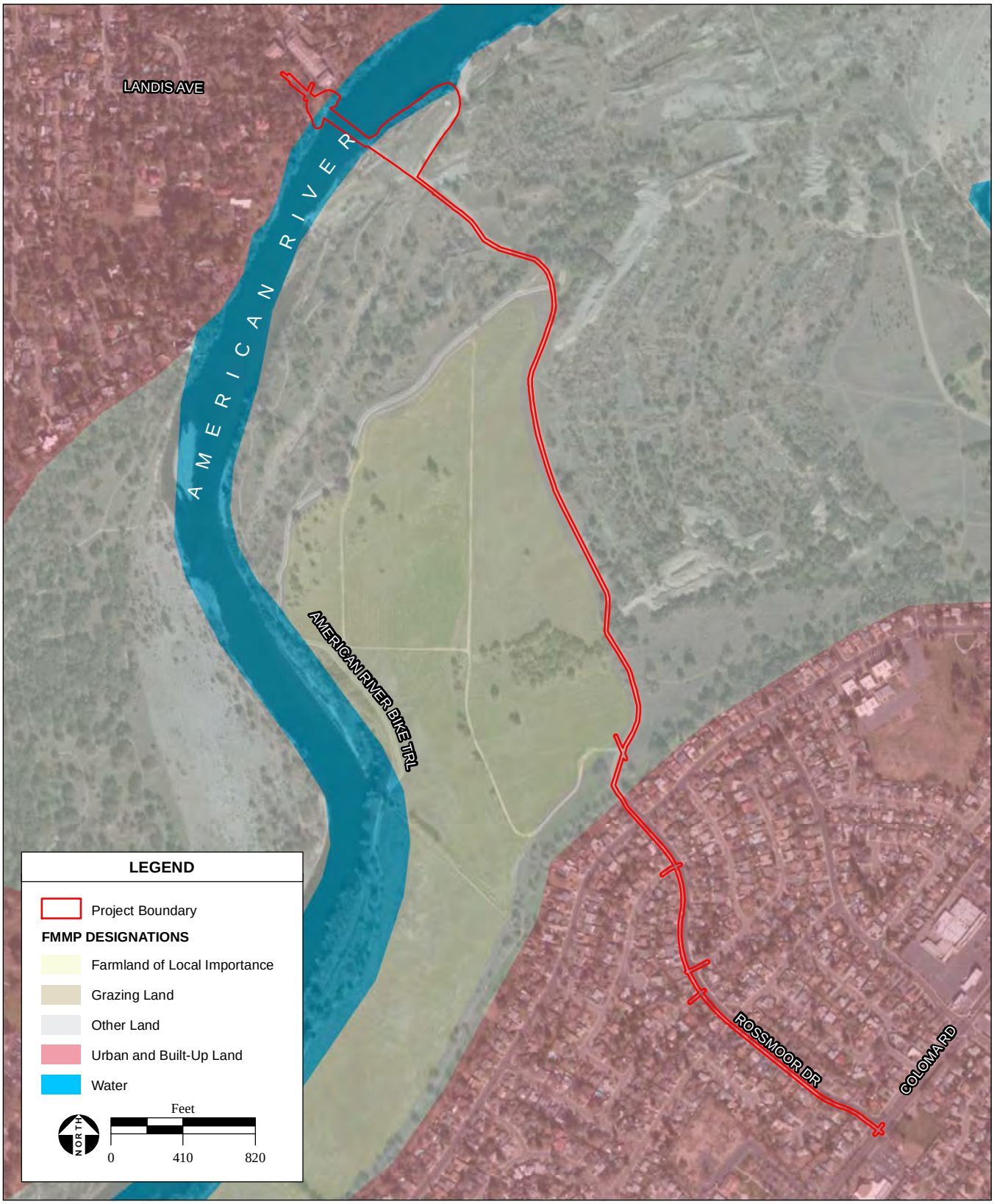
3.3 AGRICULTURE AND FOREST RESOURCES

3.3.1 SETTING

All of the project components are in areas designated as Urban and Built-Up Land or Other Land (Dredge Tailings) (California Department of Conservation, 2010). "Urban or Built-Up Land" is defined as land occupied by structures with a building density of at least 1 unit to 1.5 acres, and commonly includes residential, industrial, and commercial facilities. "Other Land" is defined as land that is not included in any other mapping category (California Department of Conservation, 2010).

As shown on **Figure 6**, there is no Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance on the project site. The surrounding area generally includes residential development ("Urban or Built-Up Land") or the American River Parkway, which is an open space area designated for recreation ("Other Land"). There is an area of Farmland of Local Importance within the American River Parkway to the southwest of the project site, although this area is not actively farmed.

There is no forest or timber land in the vicinity of the Proposed Project. Each project component will be located within previously disturbed areas owned by the District or for which the District has an easement, which are not zoned for agricultural or timberland production, nor bound by a Williamson Act contract.



SOURCE: CA Dept. of Conservation, Farmland Mapping and Monitoring Program (FMMP),2010; AEX Aerial Photograph, 6/15/2007; AES, 2014

Figure 6

Farmland Mapping and Monitoring Program (FMMP) Designations

3.3.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

AGRICULTURAL AND FOREST RESOURCES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the State's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined in Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment, which due to their location or nature, could result in conversion of farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Questions A, B, and E – Agricultural Resources

The project site is not located in an area identified as Prime Farmland, nor is it being used for or zoned for agricultural use. There are no Williamson Act contracts on the project site. Construction of the Proposed Project would not require re-zoning of any parcels, and would not involve the conversion of farmland to non-agricultural use. Therefore, the Proposed Project would not result in a significant impact on the County's or region's agricultural resources. **No Impact.**

Questions C, D, and E – Forest Resources

The project site is not located in an area defined as timber or forest land, nor is it being used for or zoned for timberland production. Therefore, the Proposed Project will not result in a significant impact on the County's or region's forest resources. **No Impact**.

Cumulative Impacts

The Proposed Project would not result in the conversion of agriculture or forest land; therefore no cumulative impacts would occur. **No Impact.**

3.3.3 MITIGATION MEASURES

None required.

3.4 AIR QUALITY

3.4.1 SETTING

The project site is located in the Sacramento Valley Air Basin (SVAB). Summer months are often characterized by high temperatures, approximately 90 degrees Fahrenheit (°F) with little to no rainfall. Winter months are mild with temperatures in the mid-50 °F. During the winter, there is an average of 17 inches of precipitation (WRCC, 2014). The SVAB is continually influenced by outside meteorology due to the unique topography of the air basin in relationship to the San Francisco Bay Area Air Basin and the San Joaquin Valley Air Basin.

The project site is located within the Sacramento Municipal Air Quality Management District (SMAQMD) boundaries. The SMAQMD has jurisdiction over air quality in Sacramento County in accordance with the Clean Air Act (CAA) and under the delegation of the California Air Resource Board (CARB) and the U.S. Environmental Protection Agency (EPA). The SMAQMD regulates air quality through its permit authority over most types of stationary emission sources and through its planning and review activities.

Ambient Air Quality Standards

Under the CAA, the EPA establishes maximum ambient concentrations for the six criteria air pollutants (CAPs), known as the National Ambient Air Quality Standards (NAAQS). The six CAPs are ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), lead (Pb), and particulate matter 10 and 2.5 microns in size (PM_{10} and $PM_{2.5}$). Concentrations above these time-averaged limits are anticipated to cause adverse health effects to sensitive receptors. The EPA has established violation criteria for each CAP. For example, in order to constitute a violation, the NAAQS for ozone must be

exceeded on more than three days in three consecutive years. On the other hand, if the NAAQS for carbon monoxide is exceeded on more than one day in any given year, a violation has occurred.

The California CAA establishes maximum concentrations for the six CAPs, as well as four additional air pollutants in California (visibility reducing particles, sulfates (SO_4), hydrogen sulfide (H_2S), and vinyl chloride). These maximum concentrations for the State are known as the California Ambient Air Quality Standards (CAAQS). Concentrations above these time-averaged limits are anticipated to cause adverse health effects to sensitive receptors. The CARB is part of the California Environmental Protection Agency (CalEPA) and has jurisdiction over local air districts, and has established its own standards and violation criteria for each CAP under the CAAQS. Refer to **Table 3-1** for the standards and attainment status for the various averaging times for criteria pollutants of concern in the SVAB under the NAAQS and CAAQS. As shown in **Table 3-1**, SVAB is in non-attainment for 8-hour ozone, PM_{10} (24-hour), and $PM_{2.5}$ (24-hour) under the NAAQS; and 1- and 8- hour ozone, PM_{10} (annual), and $PM_{2.5}$ (annual) under the CAAQS.

TABLE 3-1
NAAQS AND CAAQS AND ATTAINMENT STATUS IN THE SVAB

Pollutant	Standard		Status	
	California	Federal	California	Federal
Ozone (1-hour)	0.09 ppm	-	Non-attainment	N/A
Ozone (8-hour)	0.07 ppm	0.075 ppm	Non-attainment	Non-attainment
PM_{10} (24-hour)	50 µg/m^3	150 µg/m^3	Attainment	Non-attainment
PM_{10} (annual)	20 µg/m^3	-	Non-attainment	N/A
$PM_{2.5}$ (24-hour)	-	35 µg/m3	N/A	Non-attainment
$PM_{2.5}$ (annual)	12 µg/m^3	12 µg/m^3	Non-attainment	Unclassified
Carbon Monoxide (8-hour)	9.0 ppm	9 ppm	Attainment	Attainment
Nitrogen Dioxide (annual)	0.030 ppm	0.053 ppm	Attainment	Attainment
Nitrogen Dioxide (1-hour)	0.18 ppm	0.100 ppm	Attainment	Attainment
Lead (30 day average)	1.5 µg/m^3	-	Attainment	Attainment
Sulfur Dioxide (24-hour)	0.04 ppm	0.14 ppm	Attainment	Attainment
Visibility Reducing Particles	-	N/A	Attainment	N/A
Sulfates	25 µg/m^3	N/A	Attainment	N/A
Vinyl Chloride	0.01 µg/m^3	N/A	Attainment	N/A
Hydrogen Sulfide	0.03 ppm	N/A	Attainment	N/A
Source: CARB, 2014a				

Sensitive Receptors

Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality related health problems. Residential areas are considered sensitive to poor air quality, because people usually stay home for extended periods of time, increasing the potential exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

The land surrounding the project site is primarily open space and residential, with recreational land uses provided by the American River Parkway. The distance to the nearest residential sensitive receptors is approximately 25 feet for the pipeline construction along Rossmoor Drive. On the north bank project site, there are existing residences within 100 feet of proposed construction activities. There are no hospitals or schools in the vicinity of the project site.

Regulatory Context

The SMAQMD revised *Guide to Air Quality Assessment in Sacramento County* (SMAQMD CEQA Guide) provides significance thresholds for assessment of project-level impacts to air quality (SMAQMD, 2014). The ozone precursors nitrogen oxides (NO_X) and reactive organic gases (ROGs) have significance thresholds as shown in **Table 3-2**. The significance thresholds for all other CAPs is equal to the CAAQS, meaning a project's impact to air quality is only significant should it by itself cause an exceedance of the regional CAAQS.

TABLE 3-2
SMAQMD SIGNIFICANCE THRESHOLDS

Pollutant	Construction	Operation
Ozone Precursor – NO_X	85 pounds/day	65 pounds/day
Ozone Precursor – ROG	None	65 pounds/day
Source: SMAQMD, 2014		

3.4.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

AIR QUALITY	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Where applicable, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c) 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) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Question A, B, and C

Construction

The Proposed Project emissions would not exceed any applicable thresholds (**Table 3-3**). Therefore, the Proposed Project would not conflict with or obstruct implementation of any applicable air quality plans. The Proposed Project would not violate any air quality standards, nor contribute substantially to an existing or projected air quality violation. The Proposed Project would not 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).

TABLE 3-3
ESTIMATION OF PROJECT RELATED CONSTRUCTION EMISSIONS

Construction Equipment[1]	Construction Emission					
	CO	ROG	NO_2	SO_2	PM_{10}	$PM_{2.5}$
	pounds per day					
Air Compressor (jackhammer)	2.54	0.76	7.59	0.01	0.25	0.25
Other Material Handling Equipment	3.61	0.67	5.74	0.00	0.49	0.45
Genset	3.84	0.71	5.23	0.01	0.38	0.38
Other Construction Equipment	3.23	0.53	5.95	0.00	0.31	0.29
Concrete Saw	0.95	0.18	1.25	0.00	0.10	0.10
Concrete Mixer	0.23	0.04	0.28	0.00	0.01	0.01
Tractors/Loaders/Backhoes	2.14	0.32	3.03	0.00	0.24	0.22
Welder	1.02	0.31	0.93	0.00	0.08	0.08
Employee Trips	15.83	0.65	1.02	0.01	0.03	0.02
Fugitive Dust					7.3E-06	2E-06
Total Site Grading Emissions	33.38	4.18	31.03	0.04	1.88	1.79
Thresholds of Significance	***N/A***	***N/A***	***85***	***N/A***	***N/A***	***N/A***
Exceed Threshold	***N/A***	***N/A***	**No**	***N/A***	***N/A***	***N/A***

[1] Based on 20 workers per day traveling 20 miles per day.
[2] Based on 8,250 linear feet of construction activities.
Source: CalEEMod Emission Factors, 2010

Construction of the Proposed Project would require some surface grading, trenching, and fill. Therefore, as suggested by the SMAQMD, mitigation measures have been included to significantly reduce fugitive dust emission. Therefore, although this is a less-than-significant impact, best management practices (BMPs) are required in **Mitigation Measure AQ-1** to further reduce this impact. **Less than Significant with Mitigation.**

Operation

Operation of the Proposed Project would require minor ongoing maintenance of the pipeline and culvert, but would not substantially increase the level of activity above what currently occurs today. Therefore, operation of the Proposed Project would have a less-than-significant impact on air quality, and would not violate any air quality standards. **Less than Significant.**

Question D

The shortest distance between the project site and its nearest sensitive receptor is approximately 25 feet at Rossmoor Drive (refer to **Section 3.4.1**). Due to the linear nature of pipeline construction, construction activities along Rossmoor Drive are expected to occur for less than one week at any one location before construction proceeds along the pipeline route. Heavy construction equipment emissions would be the main source of pollutants near sensitive receptors and would only occur for approximately one week at any given receptor. On the north bank project site, there are existing residences within 100 feet of proposed construction activities. As discussed in **Section 2.5.4**, construction on the north bank would be temporary and would occur in fall 2015 or spring 2016. Mitigation measures would reduce construction emissions to less-than-significant levels. Operation of the pipeline itself would only consist of periodic maintenance. Given the limited duration of heavy equipment use, construction activities would not expose sensitive receptors to substantial pollutant concentrations. Construction and operation of the Proposed Project would have a less-than-significant impact on sensitive receptors. **Less than Significant.**

Question E

As discussed under **Question D**, heavy equipment would be used for approximately one week during construction near any one sensitive receptor along the pipeline corridor, and therefore odor created during the construction phase would not affect a substantial number of people and would be temporary in nature. Operation of the Proposed Project would not emit objectionable odors. Therefore, construction and operation of the Proposed Project would have a less-than-significant impact associated with odors. **Less than Significant.**

Cumulative Impacts

Air quality is cumulative in nature. NAAQS and CAAQS are predicated on past, present, and future emissions; therefore, if project-related emission are found to have a less-than-significant impact in the near-term conditions, then cumulative impacts would also typically be less-than-significant. Project-related air quality impacts were found to be less-than-significant in the near-term conditions. In addition, there are no known projects at this time that would contribute to air quality impacts. Therefore, air quality impacts in the cumulative condition are also less-than-significant. **Less than Significant.**

3.4.3 MITIGATION MEASURES

AQ-1 The following BMPs shall be implemented by the project applicant:

- Water exposed graded surfaces twice a day or as needed to address dust during construction. All material excavated, stockpiled, or graded should be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent streets.
- Limit traffic speeds on unpaved roads to 15 miles per hour (mph).
- Suspend grading activity when winds (instantaneous gusts) exceed 25 mph.
- Implement adequate dust control measures in a timely and effective manner during all phases of construction.

3.5 BIOLOGICAL RESOURCES

3.5.1 SETTING

Regulatory Context

Wetlands and Waters

The U.S. Army Corps of Engineers (USACE) has primary federal responsibility for administering regulations that concern Waters of the U.S., under Section 404 of the Clean Water Act (CWA). Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the U.S. The USACE requires that a permit be obtained if a project proposes the placement of structures within, over, or under navigable waters and/or discharging dredged or fill material into waters below the ordinary high water mark (OHWM). The USACE has established a series of nationwide permits (NWP) that authorize certain activities in waters of the U.S.

Waters of the U.S. are defined as: *"All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; and impoundments of these waters, tributaries of these waters, or wetlands adjacent to these waters*" (Section 404 of the CWA; 33 Code of Federal Regulations [CFR] Part 328). The limit of USACE jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of adjacent wetlands is defined by the ordinary high water mark (OHWM).

The OHWM is defined as: "*The line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas*" (Section 404 of the CWA; 33 CFR Part 328).

In addition, a Section 401 Water Quality Certification Permit was established to comply with CWA Sections 301, 302, 303, 306, and 307 and is regulated by the Regional Water Quality Control Board (RWQCB). Anyone that proposes to conduct a project that may result in a discharge to U.S. surface waters and/or "waters of the state" year round and seasonal streams, lakes and all other surface waters would require a federal permit. At a minimum, any beneficial uses lost must be replaced by a mitigation project of at least equal function, value, and area. Waste Discharge Requirements Permits are required pursuant to California Water Code Section 13260 for any persons discharging or proposing to discharge waste, including dredge/fill, that could affect the quality of the waters of the state.

Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) implement the federal Endangered Species Act (FESA) of 1973 (16 United States Code [USC] Section 1531 et seq.). Under the FESA, federally threatened and endangered species and their habitats (50 CFR Subsection 17.11, 17.12) are protected from "take" (i.e., activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) as well as any attempt to engage in any such conduct, unless a Section 10 Permit is granted to an individual or a Section 7 consultation and a Biological Opinion with

incidental take provisions are rendered from the lead federal agency. Pursuant to the requirements of the FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present within the project site and vicinity and determine whether the proposed project will have a potentially significant impact upon such species. Under the FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any federally listed species or result in the destruction or adverse modification of designated critical habitat (16 USC Section 1536[3], [4]). Therefore, project-related impacts to these species, or their habitats, would be considered significant and require mitigation.

Migratory Bird Treaty Act

Under the Migratory Bird Treaty Act of 1918 (16 USC Subsection 703-712), migratory bird species, their nests, and their eggs are protected from injury or death, and any project-related disturbances during the nesting cycle. As such, project-related disturbances must be reduced or eliminated during the nesting cycle.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) conserves and manages fishery resources off the coasts of the U.S., anadromous species, and Continental Shelf fishery resources of the U.S., including the conservation and management of highly migratory species through the implementation and enforcement of international fishery agreements. The NMFS enforces the MSA, and regulates commercial and recreational fishing and the management of fisheries resources. The Sustainable Fisheries Act of 1996 amended the MSA to include new fisheries conservation provisions by emphasizing the importance of fish habitat in regards to the overall productivity and sustainability of U.S. marine fisheries (Public Law 104-267). The revised MSA mandates the identification and protection of essential fish habitat (EFH) for managed species during the review of projects conducted under Federal permits that have the potential to affect such habitat. Federal agencies are required to consult with NMFS on all actions and proposed actions that are authorized, funded, or undertaken by the agency, which may adversely affect EFH (MSA 305.b.2). Adverse effects can be direct (contamination or physical disruption), indirect (loss of prey or reduction in species fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Four Fishery Management Plans (FMPs) have been prepared for species in California, Oregon, and Washington. The FMPs identify EFH for benthic fish, coastal pelagic species, Pacific salmon, and Pacific highly migratory fisheries.

California Endangered Species Act

The California Endangered Species Act (CESA) prohibits the take of State-listed threatened and endangered species. Under the CESA, State agencies are required to consult with the California Department of Fish and Wildlife (CDFW) when preparing CEQA documents. Under the CESA, the CDFW is responsible for maintaining a list of rare, threatened, and endangered species designated under State law (California Fish and Game Code 2070-2079). Project-related impacts to species on the CESA's rare, threatened, and endangered list would be considered potentially significant and require mitigation. The CDFW can authorize take if an incidental take permit is issued by the Secretary of the Interior, or if the director of the CDFW issues a permit under Section 2080 in those cases where it is demonstrated that the impacts are minimized and mitigated.

CEQA Guidelines Section 15380

The CEQA Guidelines Article 20, Section 15380 provides that a species not listed on the federal or State list of protected species may be considered rare, threatened, or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions of endangered, rare, or threatened provided in the FESA and the CESA. This section of the Guidelines provides public agencies with the ability to protect a species from any potential impacts of proposed projects until the respective government agency has the opportunity to designate (list) that species as protected, if warranted. The California Native Plant Society (CNPS) maintains an extensive list of plant species that it considers to be rare, threatened, or endangered, but have no designated status or protection under federal or State endangered species legislation. Impacts to CNPS listed species (e.g., CNPS lists 1A, 1B, and 2) are considered pursuant during CEQA environmental review under CEQA Guidelines Section 15380. CDFW also maintains a database of special-status species called the California Natural Diversity Database (CNDDB).

California Fish and Game Code, Sections 3503, 3503.5, 3511, and 3800

California Fish and Game Code Sections 3503 and 3503.5 prohibit the take or needless destruction of bird nests or eggs; and prohibit the take, possession, and destruction of birds-of-prey (birds of the orders Strigiformes and Falconiformes; owls, falcons, and hawks). California Fish and Game Code Section 3511 lists birds that are "fully protected," which may not be taken or possessed except under specific permit. Depending on the presence of special-status species or nesting raptors during periods of project construction, consultation with the CDFW may be necessary. California Fish and Game Code Section 3800 prohibit the take of nongame birds. Nongame birds are defined as, "all birds occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds."

Sacramento County General Plan

Policy CO-26 Protect areas susceptible to erosion, natural water bodies, and natural drainage systems.

Policy CO-58 Ensure no net loss of wetlands, riparian woodlands, and oak woodlands.

Policy CO-59 Ensure mitigation occurs for any loss of or modification to the following types of acreage and habitat function:

- vernal pools,
- wetlands,
- riparian,
- native vegetative habitat, and
- special status species habitat.

Policy CO-61 Mitigation should be consistent with Sacramento County-adopted habitat conservation plans.

Policy CO-71 Development design shall help protect natural resources by:

- Minimizing total built development in the floodplain, while designing areas of less frequent use that can support inundation to be permitted in the floodplain,
- Ensuring development adjacent to stream corridors and vernal pools provide, where physically reasonable, a public street paralleling at least one side of the corridor with vertical curbs, gutters, foot path, street lighting, and post and cable barriers to prevent vehicular entry.
- Projects adjacent to rivers and streams shall integrate amenities, such as trail connectivity, that will serve as benefits to the community and ecological function.
- Siting of wetlands near residential and commercial areas should consider appropriate measures to minimize potential for mosquito habitation.
- Development adjacent to steam corridors and vernal pools shall be designed in such a manner as to prevent unauthorized vehicular entry into protected areas.

Policy CO-74 Evaluate feasible on-site alternatives early on in the planning process and prior to the environmental review process that reduce impacts on wetland and riparian habitat and provide effective on-site preservation in terms of minimum management requirements, effective size, and evaluation criteria.

Policy CO-75 Maintain viable populations of special status species through the protection of habitat in preserves and linked with natural wildlife corridors.

Policy CO-79 Manage vegetation on public lands with special status species to encourage locally native species and discourage nonnative invasive species.

Policy CO-88 Where removal of riparian habitat is necessary for channel maintenance, it will be planned and mitigated so as to minimize unavoidable impacts upon biological resources.

Policy CO-89 Protect, enhance and maintain riparian habitat in Sacramento County.

Policy CO-91 Discourage introductions of invasive non-native aquatic plants and animals.

Policy CO-99 Encourage habitat restoration and recreational opportunities as an integral part of bank and levee stabilization efforts.

Policy CO-101 Stabilize the banks of rivers and streams in a manner that increases flood protection and increases riparian habitat functions.

Policy CO-102 Promote and encourage habitat restoration efforts on and adjacent to our river floodways.

Policy CO-109 Channel modifications should not prevent minimum water flows necessary to protect and enhance fish habitats, native riparian vegetation, water quality, or ground water recharge.

Policy CO-111 Channel modifications shall retain wetland and riparian vegetation whenever possible or otherwise recreate the natural channel consistent with the historical ecological integrity of the stream or river.

Policy CO-112 The use of concrete and impervious materials is discouraged where it is inconsistent with the existing adjacent watercourse and overall ecological function of the stream.

Policy CO-113 Encourage revegetation of native plant species appropriate to natural substrate conditions and avoid introduction of non-indigenous species.

Policy CO-114 Protect stream corridors to enhance water quality, provide public amenities, maintain flood control objectives, preserve and enhance habitat, and offer recreational and educational opportunities.

Policy CO-118 Development adjacent to waterways should protect the water conveyance of the system, while preserving and enhancing the riparian habitat and its function.

Policy CO-121 No grading, clearing, tree cutting, debris disposal or any other despoiling action shall be allowed in rivers and streams except for normal channel maintenance, restoration activities, and road crossings.

Policy CO-122 River and stream maintenance should allow natural vegetation in and along the channel to assist in removal of nutrients, pollutants, and sediment and to increase bank stabilization, while minimizing impacts on conveyance.

Policy CO-123 The use of native plant species shall be encouraged on revegetation plans.

Policy CO-124 Maintain and manage rivers and streams to encourage special status species.

Policy CO-127 Protect, preserve, and restore migratory routes for anadromous species.

Policy CO-130 Protect, enhance and restore riparian, in-channel and shaded riverine aquatic habitat for:

- spawning and rearing of fish species, including native and recreational nonnative, non-invasive species, where they currently spawn;
- potential areas where natural spawning could be sustainable; and
- supporting other aquatic species

Policy CO-134 Maintain and establish a diversity of native vegetative species in Sacramento County.

Policy CO-136 Prohibit the loss of mitigated resource areas.

Policy CO-139 Native trees other than oaks, which cannot be protected through development, shall be replaced with in-kind species in accordance with established tree planting specifications, the combined diameter of which shall equal the combined diameter of the trees removed.

City of Ranch Cordova General Plan

Policy NR.1.1 Protect rare, threatened, and endangered species and their habitats in accordance with State and federal law.

Action NR.1.1.2 – Review projects through the entitlement process and CEQA analysis to ensure that they comply with this policy if the site contains unique habitat, creeks, and/or wooded corridors.

Policy NR.1.7 Prior to project approval, the City shall require a biological resources evaluation for private and public development projects in areas identified to contain or possibly contain listed plant and/or wildlife species based upon the City's biological resource mapping provided in the General Plan EIR or other technical materials.

Action NR.1.7.1 – For those areas in which special status species are found or likely to occur or where the presence of species can be reasonably inferred, the City shall require mitigation of impacts to those species that ensure that the project does not contribute to the decline of the affected species populations in the region to the extent that their decline would impact the viability of the regional population. Mitigation shall be designed by the City in coordination with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW), and shall emphasize a multi-species approach to the maximum extent feasible. This may include development or participation in a habitat conservation plan.

Policy NR.1.9 The City shall require that impacts to riparian habitats be mitigated at a no net loss of existing function and value based on field survey and analysis of the riparian habitat to be impacted. No net loss may be accomplished by avoidance of the habitat, restoration of existing habitat, or creation of new habitat, or through some combination of the above.

Policy NR.3.1 Coordinate with property owners and local interest groups, such as the Sacramento Urban Creeks Council, to restore, enhance, and preserve creeks in Rancho Cordova.

Policy NR.4.4 Prior to the approval of any public or private development project in areas identified or assumed to contain trees, the City shall require that a determinate survey of trees species and size be performed. If any native oaks or other native trees six inches or more in diameter at breast height (dbh), multitrunk native oaks or native trees of 10 inches or greater dbh, or non-native trees of 18 inches or greater dbh that have been determined by a certified arborist to be in good health are found to occur, such trees shall be avoided if feasible. If such trees cannot be avoided, the project applicant shall do one of the following:

- All such trees shall be replaced at an inch-for-inch ratio. A replacement tree planting plan shall be prepared by a certified arborist or licensed landscape architect and shall be submitted to the City of Rancho Cordova for approval prior to removal of trees; or,
- The project applicant shall submit a mitigation plan that provides for complete mitigation of the removal of such trees in coordination with the City of Rancho Cordova. The mitigation plan shall be subject to the approval of the City.
- If the City of Ranch Cordova adopts a tree preservation ordinance at any time in the future, any future development activities shall be subject to that ordinance instead.

American River Parkway Plan

The American River Parkway Plan (ARPP) was adopted by the City of Sacramento, Sacramento County, and the State Legislature to manage the Parkway's natural resources and promote recreation in a natural environment with minimal impacts. Sacramento County updated the ARPP in 2008 because the context and usage of the area changed considerably since the ARPP was adopted. The 2008 ARPP update is a policy and action document that "provides a guide to land use decisions affecting the Parkway, specifically addressing its preservation, use, development and administration" (Sacramento County, 2008a).

Methodology

Database Searches

The USFWS, CNDDB, and CNPS lists are available in **Appendix B**.

Information on regionally occurring special-status species was compiled based on the USFWS list (USFWS, 2014a), the CNDDB query (CDFW, 2014a), the CNPS inventory (CNPS, 2014), and the CNDDB map of documented species occurrences within five miles of the project site. The potential for each of the regionally occurring special-status species was subsequently evaluated based on the results of the biological surveys. A discussion of the distribution and habitat requirements for each species, an evaluation of the potential for the species to occur in the project site, and a discussion of CNDDB occurrences mapped within the project sites are included in **Appendix B**. The name, regulatory status, habitat requirements, and period of identification for these potentially occurring special-status species are identified in **Appendix B**. Species that have no potential to occur in the project site are not discussed further (refer to **Appendix B**).

Biological Survey

AES senior biologist/botanist Mark Hopkins conducted a reconnaissance level survey of the project site and Action Area on August 14 and October 1, 2014. There was also a previous site visit completed December 16, 2010 by AES aquatic biologist Benjamin Barker and botanist Laura Burris, in addition to CWD personnel and Kennedy Jenks, the project engineers. The site visit consisted of documenting representative plant species within terrestrial and aquatic habitat types and evaluating whether regionally-occurring special-status species have the potential to occur within those habitat types. In addition, aquatic habitat types were identified to determine whether they would be potentially subject to USACE jurisdiction.

As discussed further in Section 1.2 of the Biological Assessment (BA; **Appendix B**), the Action Area is the area covered under federal permitting, and not merely the proposed area of disturbance. Therefore, although the project site is 5.72 acres, the Action Area encompasses a total of 22.28 acres. The Action Area includes all portions of the project site within federal jurisdiction, as well as a 50-foot buffer around the project site and an additional 1,000 foot buffer on the American River downstream of the proposed pipeline crossing to account for any impacts due to downstream mobilization and deposition of sediment.

The habitat types were classified using the *Manual of California Vegetation, Second Edition* (MCV; Sawyer et al., 2009) and were modified based on existing habitat conditions within the Action Area. Wetlands and other aquatic habitats within the study area were identified based on the wetland features

mapped on the National Wetland Inventory (NWI) map (USFWS, 2014a) and field identification using criteria defined in the *1987 Wetland Delineation Manual* by the USACE and the *Regional Supplement for the Corps of Engineers Wetland Delineation Manual: Arid West Region* (*Version 2.0*) (USACE, 2008).

Environmental Setting

Habitat Types within the Project Site and Action Area

The Action Area contains a variety of terrestrial and aquatic habitat types. Terrestrial habitat types identified within the Action Area include: ruderal/developed, annual grassland, and riparian. Aquatic habitats within the Action Area include: a perennial drainage (the unnamed drainage on the north bank) and the American River. No additional aquatic habitat was identified on the south bank below the ordinary high water mark (OHWM) of the American River, largely due to relatively quick-draining mine tailings present there. A habitat map of the Action Area is presented as **Figure 7**.

As discussed above and shown in **Figure 7**, the project site refers to the construction area, while the Action Area refers to the area within federal jurisdiction for permitting purposes. Therefore, the acreage of habitats in the project site versus the Action Area are broken down in **Table 3-4**.

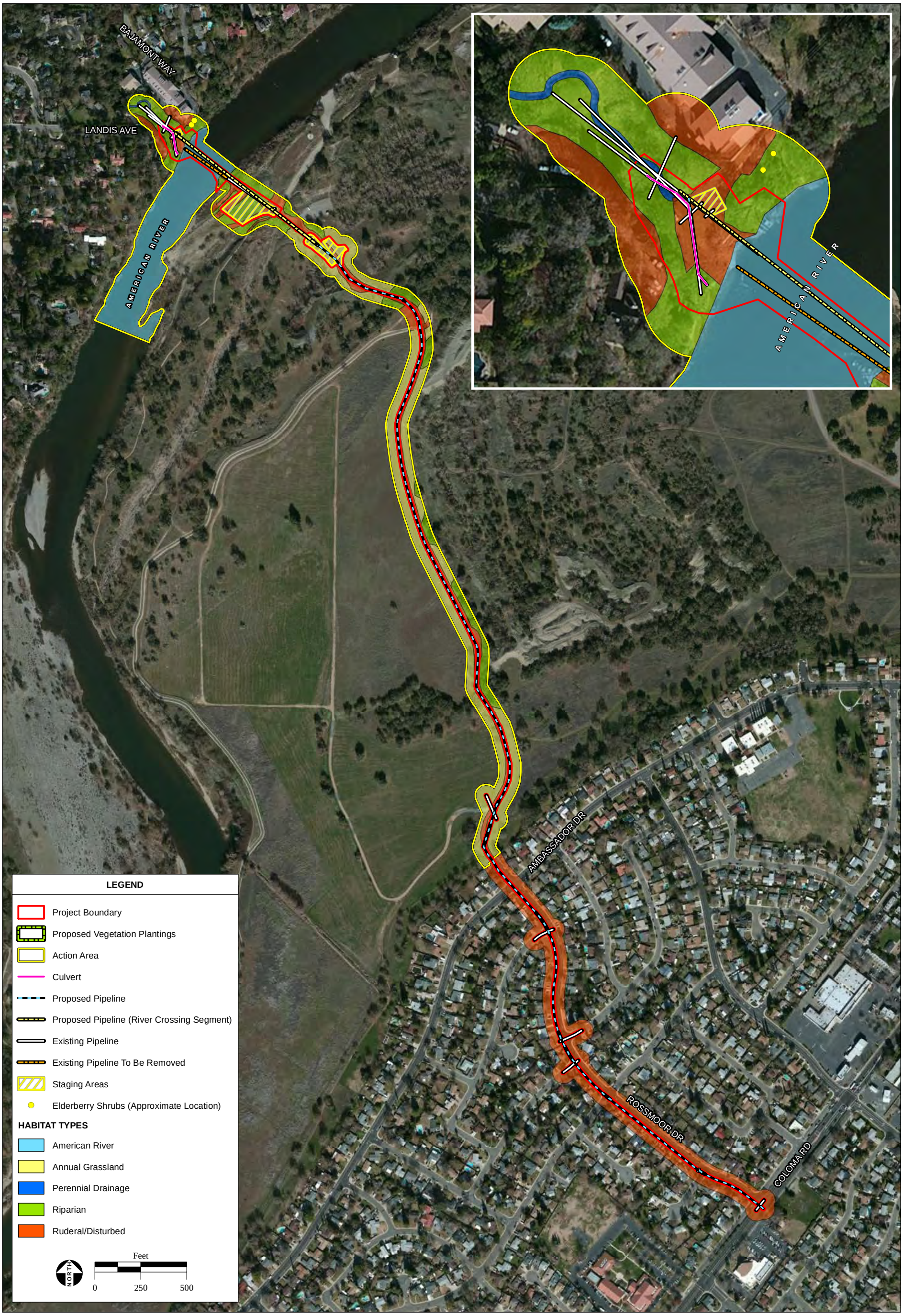
TABLE 3-4
HABITAT TYPES IN THE PROJECT SITE AND ACTION AREA

Habitat Type	Project Site	Action Area
Terrestrial Habitats		
Ruderal/Disturbed	3.71	4.59
Annual Grassland	0.67	7.46
Riparian	0.87	3.98
Subtotal	*5.25*	*16.03*
Aquatic Habitats		
American River	0.45	6.17
Perennial Drainage	0.02	0.08
Subtotal	*0.47*	*6.25*
TOTAL	**5.72**	**22.28**
Source: **Appendix B**		

Terrestrial Habitats

Ruderal/Disturbed

Approximately 4.59 acres of the Action Area is comprised of ruderal/disturbed or developed areas, which includes the existing Bajamont WTP and associated facilities along the unnamed drainage on the north bank, and paved and gravel roads on the south bank. The project site includes some additional acreage of ruderal/disturbed habitat along the length of Rossmoor Drive outside of the American River Parkway. This habitat type comprises mostly of nonnative weedy plant species and ornamental trees. Dominant vegetation observed within the ruderal/disturbed areas includes ornamental tree species such as coast redwood (*Sequoia sempervirens*), incense cedar (*Calocedrus decurens*), tree of heaven (*Ailanthus altissima*), fig (*Ficus* spp.), and olive (*Olea* spp.). The ruderal/disturbed area is shown in **Figure 8a**: **Photos 1 and 2**.



SOURCE: Kennedy-Jenks, 8/2014; DigitalGlobe aerial photograph, 2/2/2012; AES, 2014

Figure 7
Habitat Types

PHOTO 1 Looking from Rossmoor Drive in a southwesterly direction at ruderal/disturbed (road and shoulders) and annual grassland habitat (open land to the left in the photo).

PHOTO 3: Looking north at the north bank. The photo shows the areas that will have the two unused steel and concrete vaults and bank restoration.

PHOTO 5: Looking north on the north bank at the intake to the culvert for the perennial drainage.

PHOTO 2: Looking north from the ruderal/disturbed habitat. Areas on the east and west are areas being considered for staging areas.

PHOTO 4: Looking south from the north bank at the American River and the south bank of the project site. The photo was taken overlooking the area were the pipe will be removed.

SOURCE: AES, 2014

Figure 8a
Site Photographs

Annual Grassland

In California, the term 'annual grasslands' represents an area where groups of non-native plant species (primarily annual grasses) have replaced native plant communities. These areas are now dominated by non-native annual grasslands. The annual grasslands within the Action Area occur primarily along Rossmoor Drive as it passes through the American River Parkway. There are 7.46 acres of this habitat type within the Action Area, predominantly along the length of pipeline within the American River Parkway; there are 0.67 acres of annual grassland within the project site (**Figure 8a: Photos 1 and 2**). Dominant vegetation observed within the annual grassland includes wild oat (*Avena* spp.), Italian ryegrass (*Lolium multiflorum*), clover (*Trifolium* spp.), barley (*Hordeum murinum*), turkey mullein (*Eremocarpus setigerus*), filaree (*Erodium* spp.), and black mustard (*Brassica nigra*).

Riparian

The riparian corridor follows the low flow banks of the American River, which bisects the Action Area from the northeast to southwest. There are 3.12 acres of riparian habitat within the Action Area, both along the north and south bank of the American River (**Figure 8a: Photo 3**). The project site includes 0.87acres of riparian habitat.

On the northern bank adjacent to the unnamed perennial drainage, common vegetation observed in the overstory includes white alder (*Alnus rhombifolia*), Fremont cottonwood (*Populus fremontii*), willow (*Salix* spp.), tree of heaven, and live oak (*Quercus wislezenii*). The understory consists of California buckeye (*Aesculus californica*) and several non-native ground cover species including English ivy (*Hedera helix*), Italian lords and ladies (*Arum italicum*), and periwinkle (*Vinca* spp.). As shown on **Figure 7**, there are two elderberry bushes (*Sambucus mexicanus*) in the understory southeast of the Bajmount WTP; these shrubs are within the Action Area but are not within the construction footprint along the existing access road. The existing culvert proposed for replacement is underneath a planted grass area located on property adjacent to the CWD property; the property owner currently uses this turf area as a patio and recreation area (**Figure 8b: Photo 7**). CWD retains an easement.

In the immediate vicinity of the low flow channel along the south bank of the American River, the overstory vegetation consists mainly of sandbar willow (*Salix exigua*), Fremont cottonwood, Oregon ash (*Fraxinus latifolia*), tree of heaven, and valley oak (*Quercus lobata*).

Aquatic Habitats

The only wetland feature mapped within the Action Area on the NWI is the riverine wetland type of the American River (USFWS, 2014b). The unnamed drainage and the American River are the only waters of the State and Waters of the U.S. that occur within the Action Area, and would therefore fall under the jurisdiction of the USACE. These aquatic habitats are also under the jurisdiction of CDFW and RWQCB as jurisdictional waters of the State. The American River is also under the jurisdiction of the California State Lands Commission (CSLC). The Central Valley Flood Protection Board (CVFPB) also identifies the American River from its confluence with the Sacramento River to Nimbus Dam as under its jurisdiction and needing an encroachment permit.

American River

The American River bisects the Action Area from the northeast to the southwest (**Figure 8a: Photo 4**). The river at this location is approximately 250 to 300 feet wide. Flows in the American River within the Action Area are controlled by water release from Folsom Dam. Prior to the construction of Nimbus Dam

(the regulating reservoir for Folsom Dam) and the related CDFW fish hatchery located on the south bank at its base, peak flows typically occurred in late spring and during peak snowmelt runoff. Peak flows now usually occur in late winter through early spring, and are associated with flood control releases. The hydrograph curve now is characterized by step flows that are ramped up and down over brief periods. The reach of the American River within the Action Area consists of mostly run and glide flow habitats at flows between 500 and 2,000 cfs.

~~Perennial~~ Unnamed Drainage in Good Bly Ravine

The unnamed ~~perennial~~ drainage within Good Bly Ravine drains to ~~which flows into~~ the American River from the north within the Action Area and ranges from approximately two to four feet wide. The primary ongoing source of water in the unnamed drainage is treated groundwater from the Aerojet GET LB facility, as discussed in **Section 2.3**. It flows northwest to southeast within the northwestern portion of the Action Area (**Figure 8b: Photos 6 through 10**). This drainage is currently conveyed through an undersized culvert that is proposed for replacement as part of the project. This culvert is approximately 80 feet long and is buried approximately 6 to 8 feet deep. This drainage is dominated by coarse gravels, intermixed with deposits of sand. This unnamed drainage is largely ephemeral until it passes the Aerojet GET LB facility, where it receives a constant permitted discharge of 600 gallons per minute (gpm), resulting in a perennial flow of water being discharged through the culvert into the American River. This discharge was observed during the survey. Therefore, the unnamed drainage functions as a perennial drainage, although the Aerojet GET LB discharges are an artificial source of water in this system.

Critical Habitat and Essential Fish Habitat (EFH)

As shown in **Figure 9**, the American River is designated critical habitat for Central Valley steelhead and EFH for all federally listed fish species under the Magnuson-Stevens Fishery Conservation and Management Act (MSFA). EFH for Central Valley steelhead has not been identified or described; however, EFH for fall/late fall-run Chinook occurs within the Action Area and is classified as a migratory corridor providing passage, spawning, and rearing habitat. The reach of the river within the Action Area is classified as "accessible" by CDFW in its Calfish BIOS passage database (CDFW, 2014b).

Special-Status Species

For the purposes of this assessment, special-status is defined to include those species that are:

- Listed as endangered or threatened under the FESA (or formally proposed for, or candidates for, listing);
- Listed as endangered or threatened under the CESA (or proposed for listing);
- Designated as endangered or rare, pursuant to California Fish and Game Code (§1901);
- Designated as fully protected, pursuant to California Fish and Game Code (§3511, §4700, or §5050);
- Designated as species of concern by the CDFW;
- Plants or animals that meet the definitions of rare or endangered species under CEQA Guidelines Section 15380; or
- Plants considered by the CNPS to be "rare, threatened, or endangered in California" (plants with California Rare Plant Rank [CRPR] 1A, 1B, and 2).

PHOTO 6: Looking south at the outflow of the perennial drainage into the American River.

PHOTO 8: Looking south at the outflow of the perennial drainage into the American River.

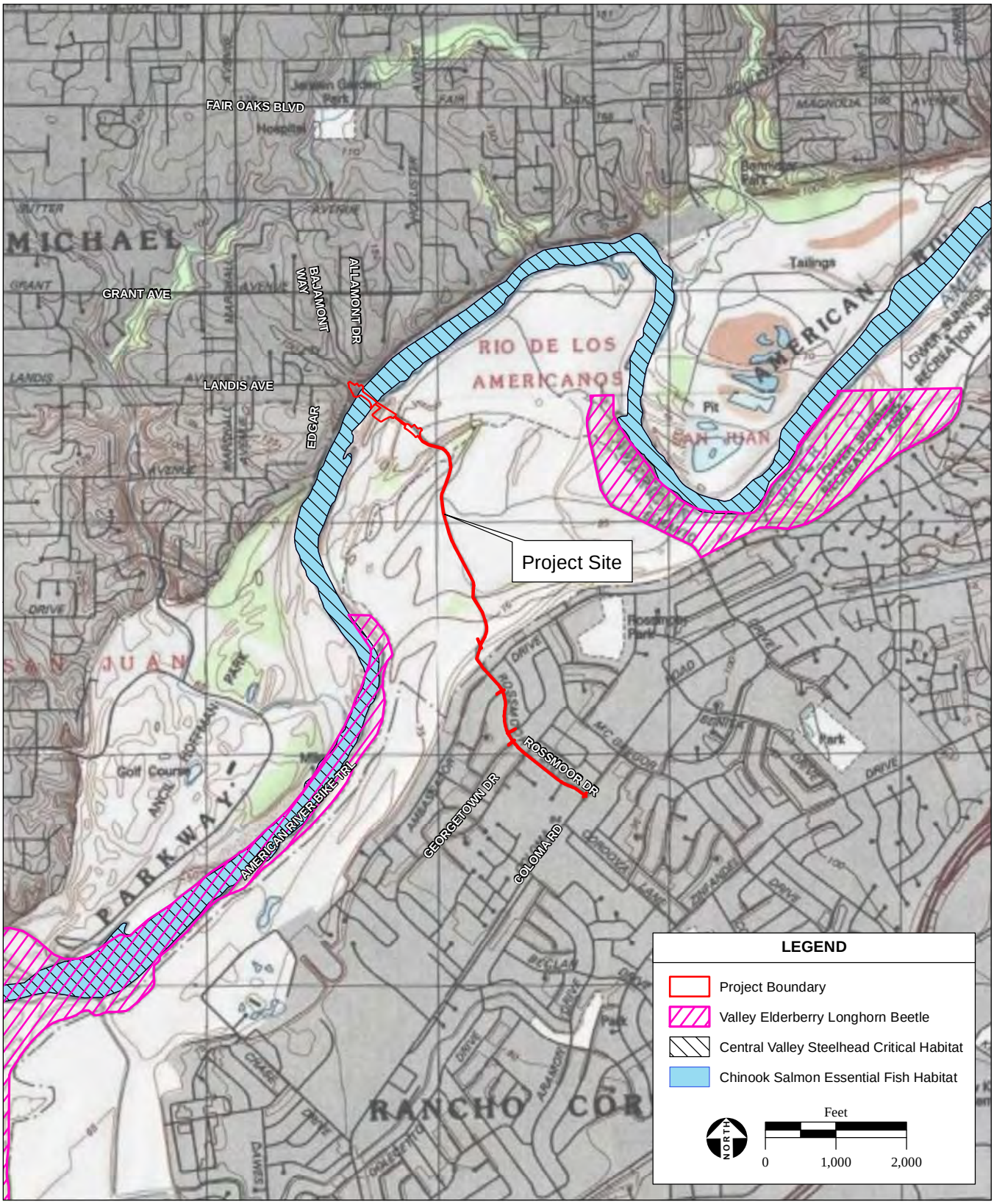
PHOTO 10: Looking at the culvert on the north bank where it drops discharge into a plunge pool before flowing into the American River.

PHOTO 7: Looking north on the north bank at the intake to the culvert for the perennial drainage.

PHOTO 9: Looking at unnamed drainage on the north bank of the American River where it enters culvert.

SOURCE: AES, 2014

Figure 8b
Site Photographs



SOURCE: USFWS Critical Habitat Surveys of Sacramento County, 1980; "Citus Heights, CA" & "Carmichael, CA" USGS 7.5 MinuteTopographic Quadrtangles,T9N, R6E, Unsectioned Areas of Citrus Heights & Carmichael, Mt. Diablo Baseline & Meridian; AES, 2014

Figure 9
Critical Habitats

As shown in **Table 3-5**, two special-status plant species, one special-status invertebrate, two special-status fishes, one special-status reptile, seven special-status birds, and one special-status mammal have the potential to occur within the Action Area.

TABLE 3-5
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE ACTION AREA

Scientific Name Common Name	Federal/ State/ CNPS Status	Distribution	Habitat	Period of Identification	Potential to Occur On-Site
Plants					
Hibiscus lasiocarpos var. *occidentalis* Wooly rose-mallow	--/--/1B.2	Known to occur in Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo Counties (CNPS, 2014).	Often found on rip-rap on the sides of levees. Occurs in freshwater marshes and swamps. Elevation ranges from 0-394 ft (CNPS, 2014).	June-September	**Yes.** Suitable habitat for this species is present along the south bank of the American River.
Juglans hindsii Northern California Black Walnut	--/--/1B.1	Known to occur in Contra Costa, Lake, Napa, Sacramento, Solano, and Yolo counties (CNPS, 2014).	Riparian forests and riparian woodlands. Elevation: 0-1,444 feet (CNPS, 2014).	April-May	**No.** This species is not present within the project site and would not be impacted by the Proposed Project.
Animals					
Invertebrates					
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT/--/--	Know throughout the riparian forests of the Central Valley from Redding to Bakersfield. Counties include Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Kern, Madera, Mariposa, Merced, Napa, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba.	Riparian forest communities. Exclusive host plant is elderberry (*Sambucus* species), which must have stems ≥ 1-inch diameter for the beetle. Elevations range from 0-2,500 feet.	All Year	**Yes.** The riparian corridor within the Action Area provides suitable habitat for this species, although the project site is outside of designated critical habitat for this species. There are two elderberry shrubs that may provide potential habitat for this species within the Action Area.
Fishes					
Oncorhynchus mykiss steelhead Central Valley Steelhead	FT/--/--	Spawn in the Sacramento and San Joaquin rivers and tributaries before migrating to the Delta and Bay Area.	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	Consult Agency	**Yes.** The American River provides suitable habitat for this species within the Action Area.

Scientific Name Common Name	Federal/ State/ CNPS Status	Distribution	Habitat	Period of Identification	Potential to Occur On-Site
Oncorhynchus tshawytscha Chinook salmon Central Valley fall-late fall run	FE/CE/--	Spawn in the upper Sacramento River. Juveniles migrate from spawning grounds to the Pacific Ocean.	Returns to the Upper Sacramento River in the winter but delay spawning until spring and summer. Juveniles spend 5-9 months in the river and estuary before entering the ocean.	Consult Agency	**Yes.** The American River provides suitable habitat for this species within the Action Area.
Reptiles					
Actinemys (Emys) marmorata Western pond turtle	--/CSC/--	Known to occur throughout California, Oregon and Washington with some distribution in Nevada. Occurs in Sacramento County (NatureServe, 2014).	Found basking on instream debris, more commonly underwater. Prefers sandy upland habitat for breeding. Habitat includes permanent or intermittent waters of streams, medium gradient rivers, and ponds (NatureServe, 2014).	April-August (Timing varies based on location-confirm with agency)	**Yes.** The American River and unnamed drainage provide suitable habitat for this species.
Birds					
Accipiter cooperii Cooper's hawk	--/WL/--	Known to occur from Siskiyou Co. south to San Diego Co; also scattered nesting in interior valleys and woodlands of Coast Range from Humboldt Co. south, and in western foothills of the Sierra Nevada	Deciduous, mixed, and evergreen forests and deciduous stands of riparian habitat. Ranges from sea level to above 8,858 feet.	All Year	**Yes.** The riparian area along the American River provides suitable habitat for this species.
Agelaius tricolor tricolored blackbird	--/CSC/--	Restricted to the Central Valley and surrounding foothills, throughout coastal and some inland localities in southern California, and scattered sites in Oregon, western Nevada, central Washington, and western coastal Baja California.	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	All Year	**Yes.** The American River provides suitable habitat for this species; however, the Action Area lacks the appropriate dense thickets needed for nesting.
Buteo swainsoni Swainson's hawk	--/CT/--	In California, breeds in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, Antelope Valley, and in eastern San Luis Obispo County.	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands, alfalfa, or grain fields supporting rodent populations.	March – October	**Yes.** The Riparian area along the American River provides suitable habitat for this species within the Action Area.

Scientific Name Common Name	Federal/ State/ CNPS Status	Distribution	Habitat	Period of Identification	Potential to Occur On-Site
Coccyzus americanus occidentalis Western yellow-billed cuckoo	FT/--/--	In California, breeding populations of greater than five pairs which persist every year in California are currently limited to the Sacramento River from Red Bluff to Colusa and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. (Laymon and Halterman 1987).	Western yellow-billed cuckoos prefer isolated wooded riparian corridors surrounded by extensive arid uplands.	May - October	**Yes.** The riparian area along the American River provides suitable habitat for this species within the Action Area.
Pandion haliaetus Osprey	--/WL/--	Found throughout North and South America. Known as a "passage migrant" in the central valley of California.	Found along large to medium-sized rivers in cliffs, forested wetland, or riparian corridors. Nests are often established on the tops of large man-made structures. Ospreys eat almost exclusively fish.	Timing varies within range. Consult Agency.	**Yes.** The American River provides suitable habitat for this species within the Action Area.
Progne subis Purple martin	--/CSC/--	Known from Mendocino, Napa, Sonoma, Lake, Riverside, Sacramento, San Luis Obispo, Placer, Shasta, San Diego and Monterey Counties.	Found in a variety of wooded, low-elevations habitats. Uses valley foothill and montane hardwood, valley foothill and montane hardwood-conifer, and riparian habitats. Also occurs in coniferous habitats, including closed-cone pine-cypress, ponderosa pine, Douglas-fir, and redwood. Inhabits more open areas in winter.	All Year	**Yes.** The American River provides suitable habitat for this species within the Action Area.
Riparia riparia bank swallow	--/CT/--	In California, primarily nests from Siskiyou, Shasta and Lassen Counties, south along the Sacramento River to Yolo County. Also nests locally across much of state.	Found primarily in riparian and other lowland habitats west of the deserts during the spring-fall period. In summer, restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes.	April - July	**No.** The American River provides suitable habitat for this species, but the Action Area does not contain the vertical banks required for nesting.

Mammals					
Antrozous pallidus pallid bat	--/CSC/--	Locally common species at low elevations. It occurs throughout California except for the high Sierra Nevada from Shasta to Kern cos., and the northwestern corner of the state from Del Norte and western Siskiyou cos. to northern Mendocino Co.	Habitats occupied include grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests, generally below 6,562 feet. The species is most common in open, dry habitats with rocky areas for roosting. Roosts also include cliffs, abandoned buildings, bird boxes, and under bridges.	All Year	**Yes.** The grasslands provide suitable foraging habitat for this species within the project site, although no suitable roost sites were identified within the Action Area.

FEDERAL: United States Fish and Wildlife Service
FE Federally Endangered
FT Federally Threatened
FC Federal Candidate for Listing

STATE: California Department of Fish and Wildlife
CE California Listed Endangered
CR California Listed Rare
CT California Listed Threatened
CSC California Species of Special Concern
CFP California Fully-Protected
WL California Watch List

CNPS: California Native Plant Society
List 1A Plants Presumed Extinct in California
List 1B Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3 Plants about Which We Need More Information- A Review List

Sources: USFWS, 2014; CDFW, 2014; CNPS, 2014; Moyle, 2002 (fish); CaliforniaHerps.com 2011 (herps).

Special-Status Plants

Wooly Rose-Mallow (*Hibiscus lasiocarpos* var. *occidentalis*)
Federal Status – None
State Status – None
Other – CRPR 1B.2

The wooly rose- mallow has a large white hibiscus flower with a red center; unique from other hibiscus species in that the leaves and stems are covered in fine hairs. The wooly rose-mallow is a perennial herb with many stems protruding 3 to 6 feet from the base. The flowering stalks are approximately 0.4 to 3.1 inches long, and the flowers are a distinctive white with a rose-red center. Often found in riprap on sides of levees, or in freshwater marshes and swamps, it is native to riparian areas around the Sacramento River. Most occurrences are very small. The wooly rose-mallow is seriously threatened by habitat disturbance, development, agriculture, recreational activates, and channelization of the Sacramento River and its tributaries; it is also threatened by weed control measures and erosion. The evident and identifiable bloom season for this species is June through September. The south bank of the American

River may provide habitat for this species. Because the biological and botanical surveys were conducted outside of the blooming period of the wooly rose-mallow, it may be present within the Action Area.

Northern California Black Walnut (*Juglans hindsii*)
Federal Status – None
State Status – None
Other – CRPR 1B.1

The northern California black walnut is a large tree (up to 60 ft tall) endemic to northern California riparian woodlands. The leaves are generally about 1 foot long and, unlike the southern California walnut, the vein angles are hairy. The nut has a thick shell that is smooth and brown. Its historic range runs from the San Joaquin Valley and Sacramento Valley to the Inner Northern California Coast Ranges and San Francisco Bay Area, in Northern California. Due to serious threats from hybridization with orchard trees, urbanization, and habitat conversion to agriculture, there is only one confirmed native stand remaining. Its bloom period is from April to May, but the tree can be identified year round. While the American River riparian habitat may provide habitat for this species, biological and botanical surveys did not identify any individuals in or around the Action Area. Therefore, it is not present in the Action Area.

Special-Status Wildlife

Invertebrates

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)
Federal Status – Threatened
State Status – None

Biology: The valley elderberry longhorn beetle (VELB) is only found in close association with its host plant, elderberry (*Sambucus* spp.). Elderberry plants are found in or near riparian and oak woodland habitats. The VELB's life history is assumed to follow a sequence of events similar to those of related taxa. Female beetles deposit eggs in crevices in the bark of living elderberry plants. Presumably, the eggs hatch shortly after they are laid, and the larvae bore into the pith of the trunk or stem. When larvae are ready to pupate, they move through the pith of the plant, open an emergence hole through the bark, and return to the pith for pupation. Adults exit through the emergence holes and can sometimes be found on elderberry foliage, flowers, or stems or on adjacent vegetation. The presence of exit holes in elderberry stems indicates previous VELB habitat use. Exit holes are cylindrical and approximately 0.25 inch in diameter. Exit holes can be found on stems that are 1 or more inches in diameter. The holes may be located on the stems from a few inches to about 9 to 10 feet above the ground (Barr, 1991).

Regional Distribution and Critical Habitat: The VELB's range extends from southern Shasta County to Fresno County (Talley et al. 2006). Along the eastern edge of the species' range, adult beetles have been found in the foothills of the Sierra Nevada at elevations up to 2,220 feet, and beetle exit holes have been located on elderberry plants at elevations up to 2,940 feet. Along the western edge of the species' range, adult beetles have been found on the eastern slopes of the Coast Ranges at elevations of up to 500 feet, and beetle exit holes have been detected on elderberry plants at elevations up to 730 feet (Barr, 1991). There is critical habitat listed for the VELB along the American River both upstream and downstream of the Action Area, although the Action Area itself does not fall within designated critical habitat (**Figure 9**).

Potential to Occur in the Action Area: The Action Area includes potentially suitable habitat for the federally-listed VELB, which has the potential to occur in the elderberry bushes identified within the Action Area along the American River, as shown on **Figure 10**. Although no host elderberry shrubs were identified within the disturbance footprint of the Proposed Project, there are two elderberry shrubs with stems measuring between 1 and 3 inches at ground level within 10 feet from an existing access road in the Action Area. These shrubs will be fully avoided by construction activities. The access road will not be modified by the Proposed Project, but will be utilized to provide access to the north bank of the project site. Construction activities would occur approximately 75 to 100 feet from these two shrubs.

Fishes

Central Valley Steelhead (*Oncorhynchus mykiss*) Distinct Population Segment
Federal Status – Threatened
State Status – None

Biology: Adult Central Valley steelhead begin their migration from the ocean in the late fall through early winter and typically arrive at their spawning grounds between December and April, spawning shortly after arrival. Unlike other Pacific Coast salmonid species, not all Central Valley steelhead die after spawning, and some individuals may spawn two or more times (Moyle, 2002). Spawning takes place in relatively shallow water, typically glides shallow runs at depths ranging from 8 to 39 inches. Preferred spawning substrate is gravel ranging from 0.12 to 3.9 inches diameter. The optimum temperature for egg development is 9 to 11 °C (48 to 52 °F). After emergence, fry seek shallow edge water habitat for several months after which they disperse into suitable mid-channel habitat. Optimum juvenile growth and survival occurs at temperatures ranging from 13 to 17 °C (55 to 64 °F) with dissolved oxygen (DO) levels greater than 9 milligrams per liter (mg/L). Juveniles remain in the freshwater environment for one to two years where they forage mainly on aquatic invertebrates prior to migrating to the Pacific Ocean. They typically spend one to three years in near shore saltwater habitat foraging on crustaceans, small fish, and squid before reaching maturity and returning to their natal streams to spawn (Moyle, 2002; McEwan and Jackson, 1996).

Table 3-6 presents the life history of Central Valley steelhead within the American River. As shown in **Table 3-6**, adult migration occurs from November through April, with peak migration occurring from December through March. Spawning occurs from December through April. Juvenile rearing occurs throughout the year. The months of July through October have the fewest occurrences of this species in the American River.

TABLE 3-6
CENTRAL VALLEY STEELHEAD LIFE STAGE USE BY MONTH, AMERICAN RIVER

Life Stage	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Adult Migration	X	X	X	x							x	X
Spawning	X	X	X	X								X
Incubation/Emergence	X	X	X	X	X	x						x
Juvenile Rearing	X	X	X	X	X	X	X	X	X	X	X	X
Juvenile Emigration		X	X	X	X	x					x	x

X – Peak Occurrence; x – Life Stage Present
Source: McEwan and Jackson 1996, SWRI 2001

SOURCE: DigitalGlobe aerial photograph, 4/18/2014; AES 2015

Figure 10
Elderberry Shrubs

Regional Distribution and Critical Habitat: The Central Valley steelhead distinct population segment (DPS) was originally listed as threatened on March 19, 1998 (60 FR 13347) and again on January 5, 2006 (71 FR 834). The range of this DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin Rivers and their tributaries. The range includes portions of Amador, Alameda, Butte, Calaveras, Contra Costa, Colusa, Glenn, Mariposa, Merced, Nevada, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tuolumne, Yolo, and Yuba counties (CDFW, 2014c).

Critical habitat for the Central Valley steelhead was designated on September 2, 2005 (70 Federal Register 52488 – 52627; September 2, 2005). Critical habitat for Central Valley steelhead consists of estuarine waters of San Francisco Bay, the Sacramento-San Joaquin Delta, the Sacramento and San Joaquin rivers, and all tributaries to the Sacramento and San Joaquin river systems downstream of impassable barriers in the following counties: Tehama, Butte, Glenn, Shasta, Yolo, Sacramento, Solano, Yuba, Sutter, Placer, Calaveras, San Joaquin, Stanislaus, Tuolumne, Merced, Alameda, Contra Costa. Critical habitat for Central Valley steelhead is depicted in **Figure 9**. The nearest critical habitat is the American River, located within the Action Area. No EFH has been designated for Central Valley steelhead at this time. The American River critical habitat contains three primary constituent elements (PCEs), which are discussed further in Section 5.1 of **Appendix B**.

The present distribution of steelhead in the Central Valley has been greatly reduced from its historical range, mostly due to construction of impassable dams that block access to essential spawning and rearing habitat. Historically, Central Valley steelhead spawned in the upper reaches of the mainstem Sacramento American, Feather, Yuba, Pit, McCloud rivers in the Sacramento basin; and the San Joaquin, Stanislaus, Merced, Tuolumne, Calaveras, Cosumnes, and Kings rivers in the San Joaquin basin; and in the lower reaches of numerous smaller tributaries to the these rivers.

Potential to Occur in the Action Area: The U.S. Bureau of Reclamation (BOR) conducted a spawning survey study for Central Valley steelhead in the American River between 2002 and 2005 and concluded that the annual spawning population ranged from 162 to 479 spawning fish based on the redd count population estimate method. Estimates of fry production ranged from 220,000 to 450,000, and survival to the smolt stage was estimated at 7,359 to 27,392 over this period. Hatchery smolt production averaged around 400,000 over this period. The BOR spawning survey study documented Central Valley steelhead redds within the Action Area in 2002, 2003, and 2004. The majority of the newly constructed redds were observed between mid-February and early March. Central Valley steelhead fry emergence in the American River typically peaks between early and mid-April. Fry and early stage juveniles stay in proximity to spawning areas before dispersing throughout the river and occupying more complex habitat (e.g. side channels, flow breaks, and instream cover).

Central Valley Fall/Late Fall-run Chinook Salmon (Oncorhynchus tshawytscha)
Federal Status – Species of Special Concern
State Status – Species of Special Concern (Imperiled)

Biology: Adult Central Valley fall/late-fall run Chinook salmon begin their migration from the ocean in the late summer through late fall and typically arrive on their spawning grounds between late September through early January. Spawning takes place in riffles, pool tailouts and other suitable habitats at water depths ranging from 0.25 m to 1.0 m (0.82 to 3.28 ft) and flow velocities of 0.3 to 0.8 meter per second (

0.98 to 2.62 feet per second). Preferred spawning substrate consists of gravel and small cobble ranging 0.3 cm to 15 cm (0.12 to 5.90 inches) diameter. The optimum temperature for egg development is 40 to 50 °F (4 to 10 °C). After emergence, fry seek rear in shallow edge water habitat for the several weeks to several months after which they disperse into suitable mid-channel habitat. Optimum juvenile growth and survival occurs at temperatures ranging from 54 to 60 °F (12 to 15 °C) with dissolved oxygen of greater than 7 mg/L. Juveniles typically remain in the freshwater environment for one to seven months years prior to emigrating to the Pacific Ocean. They typically spend one to four years in the ocean foraging on crustaceans, small fish, and squid before reaching maturity and returning to their natal streams to spawn (Moyle 2002; Meyers et al., 1998; Yoshiyama et al., 1998). **Table 3-7** presents the life history periodicity of Central Valley fall-late fall-run Chinook salmon in the American River.

TABLE 3-7
CENTRAL VALLEY FALL/LATE-FALL RUN CHINOOK SALMON LIFE STAGE USE BY MONTH, AMERICAN RIVER

Life Stage	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Adult Migration	x								x	X	X	X
Spawning	X	x								X	X	X
Incubation/Emergence	X	X	x	x						X	X	X
Juvenile Rearing	x	X	X	X	X	X	X					
Juvenile Emigration		x	X	X	X	X	X					

X – Peak Occurrence; x – Life Stage Present
Source: Williams, 2001

Regional Distribution: The range of the Central Valley fall/late-fall run Chinook salmon evolutionarily significant unit (ESU) includes all naturally spawned populations of fall/late-fall run Chinook salmon in the Sacramento and San Joaquin river basins east of the Carquinez Strait. Within the Sacramento River basin, most Central Valley fall/late-fall run Chinook salmon spawn in the mainstem Sacramento River between the Red Bluff Diversion Dam and Keswick Dam, although some fish spawn downstream of the Red Bluff Diversion Dam and in the American, Feather, and Yuba rivers. Small numbers also spawn in Battle Creek, Cottonwood Creek, Clear Creek, Mill Creek, as well as some other small tributaries to these streams.

The present distribution of Central Valley fall/late-fall run Chinook salmon has been greatly reduced, mostly due to the construction of impassable dams that block access to essential spawning and rearing habitat. The California Advisory Committee on Salmon and Steelhead Trout estimated that there has been a 95 percent reduction in spawning habitat for Central Valley anadromous fish (CACSST, 1988). Yoshiyama and others (1998) estimated that 82 percent of historical Central Valley fall/late-fall run Chinook salmon spawning and rearing habitat in the Central Valley has been lost. Historically, Central Valley fall/late-fall run Chinook salmon spawned in nearly all rivers and streams within Sacramento and San Joaquin river basins, limited only by natural fish barriers such as waterfalls. Rivers or river reaches no longer accessible to Central Valley fall/late-fall run Chinook salmon include: the upper Sacramento, McCloud, Pit; the Feather upstream of Oroville Dam, the American upstream of Nimbus Dam, and the Yuba upstream of Englebright Dam. The American River is designated as EFH for Chinook salmon.

Potential to Occur in the Action Area: The hydrograph of the American River within the Action Area is controlled by water release from Folsom and Nimbus dams. Prior to the construction of Nimbus Dam and the related CDFW run hatchery located on the south bank at its base, peak flows typically occurred in late spring and during peak snowmelt runoff. Peak flows now usually occur in late winter through early spring, and are associated with flood control releases. The hydrograph curve now is characterized by step flows that are ramped up and down over brief periods.

Historical population estimates for fall/late-fall run Chinook Salmon range on the order of one to two million prior to hydraulic mining practices and the construction of impassable dams. Recent population trends of fall/late-fall run Chinook salmon have fluctuated wildly in within the last 20 years, ranging from a low of around 40,000 in 2010 to over 700,000 as recently as 2002 (CDFW, 2014b). The population now consists of mostly hatchery produced fish.

The reach of the American River within the Action Area consists of mostly run and glide flow habitats at flows between 500 and 2,000 cfs. Based on review of reconnaissance photographs and field surveys, it appears that the in-stream substrate within the Action Area consists mainly of medium and large cobbles, although there appear to be patches of gravel suitable for spawning. Water quality parameters within the Action Area are generally conducive to Central Valley fall/late fall-run Chinook salmon spawning and rearing, although during dry years reduced flows result in water temperatures that are often above the optimum range for rearing. Dissolved oxygen concentrations are generally within the suitable range for successful spawning and rearing. In general, pollutant levels meet regulatory standards for toxicity, although concentrations for some heavy metals and pesticides occasionally exceed established maximum values.

Reptiles

Western Pond Turtle (*Actinemys* (*Emys*) *marmorata*) and Subspecies
Federal Status – None
State Status – California Species of Concern
Other – None

The western pond turtle is widespread in California. Suitable habitat consists of any permanent or nearly permanent water body or stream with suitable refuges, basking sites, and nesting sites. Refuge sites can be submerged logs or rocks or mats of floating vegetation. Basking sites can be partially submerged rocks or logs, as well as shallow-sloping banks with little or no cover. This species constructs nests in sandy banks if present, or in soil up to 328 feet away from aquatic habitat that is at least 4 inches deep. Nesting has been reported to occur up to 1,391 feet from water (Jennings and Hayes, 1994), but is usually closer, averaging 92 feet from aquatic habitat (Rathbun et al., 2002). Nests must have relatively high humidity in order for the hatchlings to avoid desiccation. Nesting in upland habitats takes place on hard, compact soils, in open, sunny areas with little vegetation cover (Rathbun et al., 1992; Rathbun et al., 2002). This species eats a variety of organisms, including aquatic plants, beetles, fish, and frogs (CDFW, 2005).

The northwestern pond turtle (*Actinemys marmorata marmorata*) is one of two subspecies of the western pond turtle. This subspecies occurs from Washington south to the Central Valley of California. It is found in Pacific-slope drainages to an elevation of approximately 4,700 feet. This subspecies generally leaves the aquatic site only to reproduce and to hibernate. Hibernation typically takes place from October or

November to March or April. Egg-laying typically occurs in May and June (Jennings and Hayes, 1994; CDFW, 2002; Stebbins, 2003).

Western pond turtle may occur in the Action Area and may use the surrounding riparian habitat for nesting.

Birds

Cooper's Hawk (*Accipiter cooperii*)
Federal Status – None
State Status – Watch List

Cooper's hawks are common woodland hawks that are found year-round throughout most of the continental United States. Their range extends into Canada (summer breeding) and south into Mexico (winter non-breeding). Adults are a steel gray on their backs with red to brown stripes on their underparts, and thick, dark red bands on the tail (Cornell, 2014). They nest in deciduous, mixed-deciduous, and evergreen forests, as well as in suburban and urban environments. Over time, the Cooper's hawk has adapted to life in the suburbs, and is now found in equal numbers in developed areas when compared to its natural forested habitat. The Cooper's hawk hunts other small to medium size birds. This species has the potential to nest within the Action Area, although the Action Area provides only marginal nesting and foraging habitat.

Tricolored Blackbird (*Agelaius tricolor*)
Federal Status – None
State Status – Species of Concern

This species is largely found in the Central Valley, extending into the south coast range from Monterey County southward. Populations are also documented from the Peninsular Range near San Diego County and extreme northern California. Tricolored blackbirds usually nest in large flocks, with greater than 50 breeding pairs, in dense vegetation near water or by emergent wetlands. Nesting sites are typically associated with cattails, tules, blackberry, wild rose, and occasionally willows. Nests can be built a few inches above the ground or water level to 7 feet high. Nesting typically occurs from April to July, though it may extend later into the year. During the non-breeding season, they can be found foraging in open habitats such as croplands and grassy fields. While the willows within the riparian habitat along the American River and unnamed drainage could provide marginal breeding habitat for this species, it is highly unlikely because willows are not its preferred nesting habitat. This species has a low probability of occurring within the Action Area.

Swainson's Hawk (*Buteo swainsoni*)
Federal Status – None
State Status – Threatened

Swainson's hawks arrive to their breeding grounds in the Central Valley in early March. They often nest peripherally to valley riparian systems as well as utilizing lone trees or groves of trees in agricultural fields. Valley oak, Fremont cottonwood, walnut, and large willow trees, ranging in height from 41 to 82 feet, are the most commonly used nest trees in the Central Valley (CDFW, 2003). Breeding pairs immediately construct nests then lay eggs from mid- to late-April. The eggs are incubated into mid-May when young

begin to hatch. Nesting occurs from March 1 to August 31. Typical foraging habitat includes annual grasslands, alfalfa, and other dry farm crops that provide suitable habitat for small mammals. Suitable foraging habitat nearby nesting sites is critical for fledgling success. In California, Swainson's hawks primarily breed in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. There are documented CNDDB occurrences within a five-mile radius of the Action Area. The Swainson's hawk may occur in the riparian habitat along the banks of the American River.

Yellow-Billed Cuckoo Western DPS (*Coccyzus americanus occidentalis*)
Federal Status – Threatened
State Status – None

Biology: The western yellow-billed cuckoo is a slender, long-tailed bird that usually manages to stay well hidden in deciduous woodlands. They usually sit very still, even hunching their shoulders to conceal their crisp white under parts. Bold white spots on the tail's underside are often the most visible feature on a shaded perch (Cornell Lab, 2014). The breeding habitat consists of large blocks, or contiguous areas, of riparian habitat, particularly cottonwood–willow riparian woodlands (66 FR 38611–38626). The yellow-billed cuckoo prefers dense riparian thickets with dense low-level foliage near slow-moving water sources (Dudek/ICF, 2012).

The western yellow-billed cuckoo has a short breeding season, lasting only about four months from time of arrival on breeding grounds in the spring to fall migration (Dudek/ICF, 2012). Pairs may visit prospective nest sites multiple times before building a nest together. Nest heights can range from 3 feet to as much as 90 feet off the ground, with the nest placed on a horizontal branch or in a fork of a tree or large shrub (Cornell Lab 2014). Breeding season for western yellow-billed cuckoo is generally between late May and August (USFWS, 2014c).

Regional Distribution and Critical Habitat: Western yellow-billed cuckoos use wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes (Cornell Lab, 2014). Within the Sacramento Valley, the south coast (including Ventura and Los Angeles counties), and Kern County, yellow-billed cuckoos were considered common to numerous in the late 1800s, but only fairly common by the 1920s (Hughes, 1999). However, by the 1950s, the subspecies had been extirpated north of Sacramento Valley (Hughes, 1999). Currently, the CNDDB has the western yellow-billed cuckoo presumed extant within Butte, Colusa, Glenn, Sutter, and Yuba counties. The closest known sighting was from 2013 over 3.25 miles away at William B. Pond Recreation Area. Critical habitat was proposed for the yellow-billed cuckoo on August 15, 2014 (79 FR 48548). The current critical habitat proposal does not include the American River or the Action Area.

Potential to Occur in the Action Area: The Action Area provides marginal habitat for the western yellow-billed cuckoo. The Action Area on the south bank, particularly along Rossmoor Drive, is maintained with few trees and the understory has been largely cleared to facilitate access to the boat launch. There are little if any dense tree or shrub areas within the Action Area. Within the Action Area on the north bank, the riparian corridor may provide marginal habitat for the western yellow-billed cuckoo. Although there are more trees and understory on the north side, the area is highly disturbed, with local utility companies maintaining infrastructure in the Action Area and the neighboring property owners utilizing the space for a patio area.

Osprey (*Pandion haliaetus*)
Federal Status – None
State Status – Watch List

Ospreys are unique among North American raptors for their diet of live fish, which they will dive into water to catch. Ospreys breed in the summer in Canada and parts of the Pacific Northwest, and migrate south to South America for the winter non-breeding season (Cornell, 2014). Ospreys live close to open bodies of water during breeding and non-breeding season, whether it is a saltmarsh, river, pond, reservoir, or estuary. Nests are built in the open on poles, channel markers, and dead trees, often over water. The osprey is one of the largest raptors in North America, weighing between 3 and 4 pounds and with wingspans up to 6 feet across. Ospreys that nest in Canada will begin their migration south in August, and return north between February and April. Although ospreys may utilize the American River for feeding during their migration, they are unlikely to migrate through the Action Area during project construction activities due to the timing of construction.

Purple Martin (*Progne subis*)
Federal Status – None
State Status – Species of Concern

Purple martins are widely distributed throughout the eastern U.S., and patchily distributed throughout the western U.S. In California, the species is locally distributed, with the highest concentration of populations occurring along the western Cascade and Sierra Nevada ranges; North Coast and northern Central Coast ranges; and in extreme southwest California. They inhabit woodlands and low elevation coniferous forest of Douglas fir, ponderosa pine, and Monterey pine (CDFW, 2003). The purple martin is a cavity-nester, and is generally restricted to areas with dead trees containing woodpecker holes. They are also known to nest in manmade structures such as nest boxes, highway, and railway overpass structures. Breeding season extends from April to August (Brown, 1997). This species has the potential to nest within the Action Area.

Bank Swallow (*Riparia riparia*)
Federal Status – None
State Status – Threatened

Bank swallows nest in large colonies and excavate nest burrows in steep bank cliffs, in friable soils along rivers, streams, lakes, and ocean coasts (Garrison, CDFW, 1998). Burrows are dug parallel to the ground level and perpendicular to the cliff face. Nesting sites occur in colonies of 5 to 3,000 pairs. Breeding season begins in late March and peaks in late April and early May, before winding down in late June and early July. Breeding grounds should be entirely emptied by early August. Bank swallows consume flying insects captured while they are on the wing and prefer habitats that support a large amount of insect biomass.

The bank swallow breeds throughout California, including in Siskiyou, Yolo, Shasta, Lassen, Sacramento, Monterey, Modoc, and Plumas counties, and in the Bishop area of Inyo County. Single colonies are widely scattered at other locations including Del Norte, San Francisco, San Mateo, Monterey, Santa Cruz, Mono, and Ventura counties. However, bank swallows will not likely occur within the Action Area due to the absence of vertical banks required for nesting.

Mammals

Pallid Bat (*Antrozous pallidus*)
Federal Status – None
State Status – Species of Concern

Pallid bats occur from British Columbia to Texas south to Baja California and central Mexico (Smithsonian National Museum of Natural History 2007). In California, pallid bats occur throughout the state except in the high Sierra Nevada from Shasta County to Kern County. The pallid bat is most commonly found in dry, open habitats with rocky areas for roosting. Pallid bats roost alone or in small groups (two to 20 bats). This species has three different roosts: the day roost is usually in a warm horizontal opening such as in attics or rock cracks; the night roost is usually in the open, near foliage; and the hibernation roost, which is often in buildings, caves, or cracks in rocks (CDFW 2002). Roosts generally have unobstructed entrances/exits and are high above the ground. The species is an opportunistic feeder and forages primarily over open habitats. Winter habitats are not well understood but the species does not appear to migrate long distances between summer and winter sites. There is no suitable roosting habitat (e.g., basal hollows and exfoliating bark) in the Action Area, although the south bank of the American River may provide foraging habitat (i.e. open spaces) for the pallid bat. The pallid bat was not observed onsite during the biological surveys.

Migratory Birds and Other Birds of Prey

Migratory birds and other birds of prey protected under 50 CFR 10 of the Migratory Bird Treaty Act and California Fish and Game Code § 3503, 3503.5, 3511, and 3800 have the potential to nest in the trees in or adjacent to the Action Area. While no species have yet been identified in the Action Area, preconstruction surveys will be completed to ensure nesting birds will not be adversely affected.

Wetlands and Waters of the U.S.

The Proposed Project occurs within the American River and an unnamed drainage which converges with the river within the Action Area. The American River and unnamed drainage are jurisdictional and therefore subject to USACE regulation under Section 404 of the CWA. The American River is classified as a riverine wetland. There are no other wetland habitats present within the Action Area.

3.5.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

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

Question A

Special Status Plants

The project site and Action Area provide potential habitat for one special-status plant species, the wooly rose-mallow. The biological and botanical surveys conducted on August 14 and October 1 were outside of the evident and identifiable blooming period for the wooly rose-mallow; therefore, it may be present in the Action Area. The two surveys did not identify any northern California black walnut in or around the Action Area, so there will be no impact to this species. In order to ensure the Proposed Project will not

impact special-status plant species, **Mitigation Measures BR-1** requires preconstruction surveys be completed prior to ground disturbance within the riparian habitat that provides suitable habitat for the wooly-rose mallow, and protective measures are provided to ensure any populations that are identified are not impacted by the Proposed Project. **Less than Significant with Mitigation.**

Special Status Invertebrate Species

The USFWS Conservation Guidelines state that no adverse effects to VELB are expected when project activities occur at least 100 feet from elderberry shrubs with stems measuring at least one-inch diameter at ground level. The existing access road that will transport equipment occurs within 100 feet of the two identified elderberry shrubs with stems measuring between one and three inches. The elderberry shrubs are located 75 to 100 feet from active construction activities (**Figure 10**). **Mitigation Measure BR-2** will ensure no significant impacts to potential VELB habitat by marking the road edges with highly visible orange construction fencing to prevent any disturbance to the elderberry shrubs. **Less than Significant with Mitigation.**

Special Status Fish Species

Suitable spawning and rearing habitat for Central Valley steelhead occurs within the Action Area. Construction activities have the potential to adversely affect Central Valley steelhead spawning, rearing, and migration within the Action Area. Removal of the existing pipeline within the river could result in injury or mortality to Central Valley steelhead eggs, fry, and juveniles in the immediate vicinity of the pipeline or result in disturbance and mobilization of sediment that has the potential to adversely affect Central Valley steelhead eggs, fry, and juveniles. The Action Area is within the designated EFH for Central Valley fall/late-fall run Chinook salmon, and suitable spawning and rearing habitat for Central Valley fall/late-fall run Chinook salmon occur within the Action Area. Construction activities have the potential to adversely affect Central Valley fall/late-fall run Chinook salmon spawning, rearing, and migration within the Action Area.

Juvenile Central Valley steelhead or Chinook salmon present in the immediate area would likely move from the immediate area upon the initial disturbance activities. However, juveniles that do not vacate the immediate area during removal of the existing pipeline have the potential to be adversely affected through injury or mortality. Juveniles moving from the immediate area may become more susceptible to predation. Mobilization and transport of sediment associated with removal of the existing pipeline could result in effects to Central Valley steelhead or Central Valley Chinook salmon spawning in subsequent seasons by reducing the quality of spawning gravels through the filling of some interstitial spaces. However, potential effects of sediment mobilization and transport associated with the removal of the abandoned pipeline would likely be transitory in nature and would be minimized with the implementation of mitigation measures discussed below.

As discussed in **Section 2.5**, the project components will be built in multiple stages, and each project component has a different potentially significant impact to Central Valley steelhead and Chinook salmon. These stages of construction are broken down as follows:

I. Construction activities associated with pipeline construction beneath the American River, as well as staging and operation of equipment within the staging areas, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential

to adversely affect Central Valley steelhead and Chinook salmon eggs, fry, and juveniles, depending on the timing of construction activities. However, implementation of **Mitigation Measure BR-3** will reduce potential adverse effects to Central Valley steelhead and Central Valley Chinook salmon to less-than-significant levels.

II. Construction activities associated with culvert replacement in the unnamed drainage including culvert replacement, re-sloping of the drainage, and creation of step pools, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley steelhead and Chinook salmon eggs, fry, and juveniles. However, implementation of **Mitigation Measure BR-4** will reduce potential adverse effects to Central Valley steelhead and Central Valley Chinook salmon to less-than-significant levels.

III. Construction activities associated with the removal of the concrete vaults from the north bank of the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley steelhead and Chinook salmon eggs, fry, and juveniles. However, implementation of **Mitigation Measure BR-5** will reduce potential adverse effects to Central Valley steelhead and Central Valley Chinook salmon to less-than-significant levels.

IV. Construction activities associated with removal of the abandoned pipeline across the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley steelhead and Chinook salmon eggs, fry, and juveniles, depending on the timing of construction activities. The area of impact associated with the pipeline removal consists of approximately 300 linear feet of a 33-inch diameter pipeline and associated concrete and rebar debris to be removed (approximately 87 cubic yards). The in-channel impact or work area is estimated to extend no more than 10 feet on either side of the pipeline, for a maximum temporary impact to 0.069 acre of the American River, which is Central Valley steelhead critical habitat and designated EFH for Chinook salmon. There are no long-term impacts associated with Central Valley steelhead critical habitat or Chinook salmon EFH, as the removal of the abandoned pipeline will result in a long-term benefit to the American River. In accordance with **Mitigation Measure BR-6**, this phase of construction shall occur between September 1 and October 15, when the number of anadromous fish in the American River will be lowest (refer to **Tables 3-6** and **3-7**). Implementation of **Mitigation Measure BR-6** will reduce potential adverse effects to Central Valley steelhead and Central Valley Chinook salmon to less-than-significant levels.

As discussed further in the BA (**Appendix B**), the Proposed Project may have a significant impact on designated critical habitat for Central Valley steelhead and designated EFH for Central Valley Chinook salmon. Three PCEs for the Central Valley steelhead critical habitat occur within the American River. Each phase of construction may impact designated critical habitat for Central Valley steelhead and designated EFH for Central Valley Chinook salmon, similar to the discussion presented above. However, removal of the abandoned pipeline and associated concrete encasement debris would have a beneficial long term effect on Central Valley steelhead critical habitat and Chinook salmon designated EFH because

the area of the river bottom now occupied by the pipeline and concrete encasement debris would be replaced by cobble and gravel substrate similar to the adjacent areas.

With implementation of **Mitigation Measures BR-3** through **BR-6**, impacts to steelhead and Chinook salmon habitat would be reduced to less-than-significant levels during construction. There is a long term benefit to the habitat for both Central Valley steelhead and Chinook salmon, as the Proposed Project would restore a section of the designated critical habitat and EFH, respectively.

Special Status Reptiles

A single reptile species designated as a California species of concern, the western pond turtle (*Actinemys marmorata*), has the potential to breed within slower moving areas of the American River and the unnamed drainage, and may nest within the vegetated portions of the Action Area. The Proposed Project will not permanently impact any habitat for the western pond turtle, but construction activities could impact it if it were present within the construction area. The avoidance and minimization measures identified in **Mitigation Measure BR-7** will ensure that the project has a less than significant impact to the western pond turtle. **Less than Significant with Mitigation.**

Special Status Bird Species

The Action Area provides potential roosting, nesting, and/or foraging habitat for seven special-status bird species as listed in **Table 3-5**. Currently, there are no USFWS Conservation Guidelines for the federally-listed yellow-billed cuckoo. The Proposed Project may remove a limited number of shrubs located within the Action Area, but all impacted vegetation would be replaced with native vegetation. Further, once the abandoned CWD vaults have been removed or significantly cut back into the bank and the north bank re-sloped, native trees and shrubs will be planted to improve the overall riparian corridor along the north bank. **Mitigation Measures BR-8** and **BR-9** will ensure that preconstruction surveys will be completed, and if nests are found, a no-disturbance buffer zone shall be established and delineated with construction tape or pin flags around the nests to avoid disturbance or destruction of the nest. The no-disturbance buffer distance will be determined by the biologist based on the species and location in consultation with CDFW. The no-disturbance buffer will remain in place until after the nesting season (to be lifted August to September), or until the biologist determines that the young have fledged. **Less than Significant with Mitigation.**

Special Status Mammals

The pallid bat, a California species of concern, has the potential to utilize the American River and grassland on the south bank for foraging, but roosting habitat is lacking in the Action Area. The pipeline installation in the American River Parkway may impact foraging habitat due to disturbances during construction; however, these impacts will be temporary, as the pipeline will be trenched and the area will be restored after construction is complete. Therefore, the impacts to pallid bat are less than significant. **Less than Significant.**

Question B

The riparian corridor follows the low flow banks of the American River, which bisects the Action Area from the northeast to southwest. There are 3.98 acres of riparian habitat within the Action Area, both along the north and south banks of the American River. Some construction activities, including the pipeline

removal, the culvert replacement, and abandoned vault removal, must occur within this riparian zone, and a total of 0.26 acres of riparian habitat will likely be affect by the Proposed Project. The construction of the pipeline will occur largely outside of the riparian zone within developed areas of Rossmoor Drive. However, mitigation measures are provided to ensure that all construction activities associated with the new pipeline alignment will occur outside of the American River channel and riparian corridor. **Mitigation Measures BR-3**, **BR-4**, **BR-5**, and **BR-6** also require avoidance measures to protect against direct and indirect effects to riparian habitat, including the establishment and maintenance of appropriate buffer zones delineated with orange construction fencing along the adjoining riparian corridor outside the project site; no equipment storage or other construction activities are allowed within the riparian buffer zones.

The Proposed Project will ultimately benefit the riparian habitat along the unnamed drainage and the American River, as it will remove abandoned structures, recontour the riverbanks, and discourage the growth of invasive species such as English ivy, periwinkle, Italian lords and ladies, star thistle, and tree of heaven. With the protective measures for each phase of construction provided in **Mitigation Measures BR-3** through **BR-6**, impacts are reduced to less-than-significant levels. **Less than Significant with Mitigation.**

Question C

There are no wetlands within the Action Area; however, construction of the Proposed Project will include work within two jurisdictional waters of the U.S., the American River and the unnamed drainage. Both the American River and the unnamed drainage are also waters of the State and under the jurisdiction of CDFW and the Central Valley RWQCB. As discussed in **Section 3.10**, the Proposed Project will cause erosion or siltation issues, which means a Section 401 Water Quality Certification is needed from the Central Valley RWQCB, in addition to the Section 404 Permit from USACE. Due to the proposed modifications to the bed and banks of the American River and the unnamed tributary, a Streambed Alteration Agreement (SAA) will be required from CDFW. Final mitigation requirements and habitat restoration/replacement ratios will be identified as a condition of the USACE 404 Permit and SAA obtained from the CDFW. At minimum, as a requirement of permits, the District would be required to restore the riparian vegetation impacted during construction activities at a 1:1 ratio (meaning that one acre will be restored for every one acre impacted). Impacts to federally protected wetlands and waters of the U.S. resulting from the Proposed Project are considered less than significant with mitigation incorporated. Applicable mitigation measures are provided in **Section 3.5.3** ~~**Section 4.5.4**~~ below. **Less than Significant with Mitigation.**

Question D

The Proposed Project will involve construction in and around the American River, which provides habitat for both Central Valley steelhead and fall/late-fall run Chinook salmon. As discussed in **Section 3.5.1** and **Appendix B**, the reach of the American River within the Action Area consists of mostly run and glide flow habitats at flows between 500 and 2,000 cfs. Central Valley steelhead spawning in the American River shows a preference for redd construction within glide habitat (Hannon and Deason, 2005). Based on review of reconnaissance photographs and field surveys, it appears that the in-stream substrate within the Action Area has areas of suitable habitat for spawning for both species. Water quality parameters within the Action Area are generally conducive to Central Valley steelhead spawning and rearing, although during dry years reduced flows result in water temperatures that are often above the optimum range for rearing. Dissolved oxygen concentrations are generally within the suitable range for successful

spawning and rearing. The Action Area provides habitat for two listed fish species, as well as provides a migratory corridor for these species. This is a potentially significant impact.

As discussed in **Question A**, each phase of construction may interfere with native resident or migratory fish movement, including the listed Central Valley steelhead and Central Valley fall/late-fall run Chinook salmon. Construction activities associated with pipeline construction may result in the discharge of sediment or frac-out due to horizontal directional drilling, which have been mitigated to less-than-significant levels with implementation of **Mitigation Measure BR-3**. Construction activities associated with culvert replacement may result in the discharge of sediment, which has been mitigated to less-than-significant levels with implementation of **Mitigation Measure BR-4**. Construction activities associated with the removal of the concrete vaults may result in impacts due to discharge of sediment or disturbance of riparian habitat, which has been mitigated to less-than-significant levels with implementation of **Mitigation Measure BR-5**. Removal of the abandoned pipeline across the American River has the potential to result in direct mortality to Central Valley steelhead and/or Central Valley Chinook salmon, as well as significant indirect impacts to habitat during construction. Implementation of **Mitigation Measure BR-6** reduces this impact to less-than-significant levels by restricting the construction window for this phase and having a biological monitor on-site during this phase of construction, among other protective measures. Therefore, after mitigation the Proposed Project would not result in impacts to 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. **Less than Significant with Mitigation.**

Question E

The Sacramento County General Plan and City of Ranch Cordova General Plan provide numerous policies, goals, and action items designed to protect and enhance sensitive habitats, sensitive species, and riparian corridors within their respective jurisdictions. The goals and objectives of the Proposed Project as stated in **Section 2.4** are consistent with the conservation goals of the General Plans. The culvert replacement, abandoned pipeline removal, and stream restoration components of the Proposed Project will enhance the riparian corridor and American River. Mitigation measures and project design ensure that the project will result in no net loss of riparian habitat, in accordance with Sacramento County General Plan Policies CO-59, CO-61, CO-88, CO-89, and CO-102, and the City of Rancho Cordova General Plan Policy NR.1. All reseeding and vegetation planting will be completed using native plants while also discouraging introductions of invasive plants, consistent with Sacramento County General Plan Policies CO-79, CO-91, CO-113, CO-123, and CO-134.

Furthermore, the Proposed Project will further many of the goals of the Sacramento County General Plan by restoring the river bank and unnamed drainage, removing debris in the bed and banks of the river, and stabilizing the banks while also restoring them. These efforts conform to Sacramento County General Plan Policies CO-26, CO-100, CO-101, and CO-125, as well as City of Rancho Cordova General Plan NR.5.5 and Action NR.5.5.4.

By implementing the mitigation measures listed in **Section 3.5.3**, the Proposed Project will not interfere with local policies or ordinances protecting biological resources. **Less than Significant with Mitigation.**

Question F

The portion of the project site along Rossmoor Drive in the City of Rancho Cordova occurs within the boundaries of the South Sacramento Habitat Conservation Plan (HCP). However, this portion of the project site is developed and contains no significant biological resources (Sacramento County, 2014). Therefore, the proposed pipeline alignment within Rossmoor Drive will not impact biological resources and will not conflict with the South Sacramento HCP. There are no other local HCPs or natural community conservation plans applicable to the project site or Action Area. **No Impact.**

Cumulative Impacts

Cumulative projects in the area could remove plant and wildlife resources, which could affect special-status species and their habitats, nesting and foraging habitat for resident and migratory birds, and/or local policies or ordinances protecting biological resources. The potential for impacts to biological resources as a result of the Proposed Project is limited to minor habitat alteration at the north bank of the American River, which is largely due to stream restoration components. With mitigation, this stream restoration is a beneficial impact to the American River and unnamed drainage. The pipeline installation along Rossmoor Drive would not impact biological resources. Development of the Proposed Project would not contribute to a permanent loss of regional biological resources through the incremental conversion of habitat for special-status species to human use. Mitigation measures have been specifically designed to avoid, reduce, or mitigate potential impacts to fisheries as a result of construction activities. With these measures, the Proposed Project's contribution to regional impacts to biological resources would not be cumulatively considerable. **Less than Significant with Mitigation.**

3.5.3 MITIGATION MEASURES

BR-1 Prior to construction activities beginning within 50 feet of the south and north banks of the American River, a qualified biologist or botanist shall conduct a preconstruction survey for the wooly rose-mallow in the evident and identifiable bloom season. If no wooly rose-mallow plants are identified, no further mitigation is required. Should a wooly rose-mallow be identified within 25 feet of construction activities, the qualified biologist shall establish and flag a 25-foot no disturbance buffer around the plant(s). No equipment staging shall be allowed within the buffer.

BR-2 For the protection of Valley elderberry longhorn beetle, high-visibility, orange construction fencing shall be installed along the existing road edge that will restrict access to the two elderberry shrubs that are located within the Action Area. No equipment storage or other construction activity will occur within the vicinity of the elderberry shrubs outside of the existing road.

BR-3 During construction activities associated with pipeline construction beneath the American River, as well as staging and operation of equipment associated with the pipeline, the following protective measures shall be followed:

- All construction activities associated with the new pipeline alignment shall occur outside of the American River channel and riparian corridor. Horizontal directional drilling shall be utilized to construct the new pipeline alignment 85 feet below the channel bottom.
- Avoidance measures to protect direct/indirect effects to riparian habitat shall include the establishment and maintenance of appropriate buffer zones along the adjoining riparian

corridor outside the project site. Buffer zones shall be delineated using orange construction fencing. No equipment storage or other construction activity shall occur within the riparian buffer zones.

- A Stormwater Pollution Prevention Plan (SWPPP) utilizing best management practices (BMPs) shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat.
- A CDFW-approved frac-out contingency plan for horizontal directional drilling shall be prepared and implemented by the drilling contractor to minimize the potential for frac-out, provide early detection of frac-outs, protect aquatic resources, and provide notification to CDFW immediately if a frac-out event is observed.
- All equipment re-fueling and maintenance shall occur in an approved staging area outside of the riparian zone and an agency-approved spill prevention plan will implemented by the contractor.
- The construction of the pipeline shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.

BR-4 During construction activities associated with culvert replacement in the unnamed drainage, the following protective measures shall be followed:

- The discharge flow from the Aerojet GET LB facility will either be turned off or diverted through a temporary pipeline directly into the American River during culvert replacement, re-grading, and pool creation to prevent erosion and siltation.
- All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-approved spill prevention plan will be implemented by the contractor.
- The culvert replacement shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during culvert replacement.
- The culvert replacement shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.

BR-5 During construction activities associated with removal of the concrete vaults from the north bank of the American River, the following protective measures shall be followed:

- Removal of the concrete vaults shall occur between September 1 and October 15, when the flows in the American River are at their lowest seasonal levels (typically between 500 and 1,500 cfs) and after Central Valley steelhead egg and fry life stages are completed.
- Bank stabilization measures shall be implemented immediately after removal of the concrete vaults to prevent erosion. These measures include, but are not limited to, grading to reduce the bank gradient, installation of erosion blankets, and re-vegetating with native riparian plant species.

- All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-approved spill prevention plan will be implemented by the contractor.
- The concrete vault removal shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during vault removal.
- The removal of the concrete vaults shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.

BR-6 During removal of the abandoned pipeline across the American River, the following protective measures shall be followed:

- Removal of the existing pipeline shall occur between September 1 and October 15, when the flows in the American River are at their lowest seasonal levels (typically between 500 and 1,500 cfs) and after Central Valley steelhead egg and fry life stages are completed and therefore will not be adversely affected by removal of the existing pipeline.
- Consultation with NMFS, CDFW, and the Central Valley RWQCB shall occur to determine the BMPs required to minimize disturbance and mobilization of sediment during the abandoned pipeline removal. BMPs may include but are not limited to moveable silt or sediment containment curtains and coffer dams.
- The abandoned pipeline shall be cut where it emerges from the banks and will either be lifted by crane or chained and dragged from the river channel from the staging area on the south bank. Similarly, nearshore concrete debris will lifted by crane or dragged from the river channel from staging areas on the north and south banks. To the extent feasible, no equipment will be operated within the wetted channel. To help ensure that work in the immediate vicinity of the bank does not result in sediment discharge into the American River, coffer dams may be utilized during the pipeline and debris removal activities.
- A qualified biological monitor shall be present on-site during the pipeline removal.
- All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-approved spill prevention plan will be implemented by the contractor.
- The pipeline removal shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during pipeline removal.
- The removal of the abandoned pipeline shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.

BR-7 A qualified biologist shall conduct a preconstruction survey for western pond turtle within 14 days prior to commencement of construction activities anticipated to occur within 100 feet from riparian vegetation adjacent to the American River and unnamed drainage along the north bank. Prior to commencement of daily construction activities within a 100-foot buffer of riparian vegetation adjacent to the American River and unnamed drainage, a qualified biologist shall conduct a preconstruction survey for western pond turtle. If western pond turtle is present, the biologist

shall move the species from the work site before work activities begin. A biological monitor shall be present during construction activities within a 100-foot buffer of riparian vegetation surrounding the American River and unnamed drainage. The western pond turtle may take refuge in cavity-like and den-like structures such as pipes and may enter stored pipes and become trapped; therefore, all construction pipes, culverts, or similar structures that are stored at the construction site for one or more overnight periods shall be either securely capped prior to storage or thoroughly inspected by the biological monitor for these animals before the pipe is subsequently buried, capped, or otherwise used or moved.

BR-8 If tree and shrub trimming/ removal activities are conducted during the breeding seasons of any migratory birds (generally between late May and August), a qualified biologist shall conduct a preconstruction survey within 14 days prior to commencement of any construction activities to determine if active nests are present. A report shall be prepared and submitted to the Carmichael Water District following the preconstruction survey to document the results. If surveys show that there is no evidence of nests, then no additional mitigation will be required provided construction commences within 14 days prior to the preconstruction survey.

BR-9 Following a preconstruction nesting bird survey, if any active nests of cuckoos or other migratory birds are located within the vicinity of the Action Area, a no-disturbance buffer zone shall be established around the nests to avoid disturbance or destruction of the nest. The distance around the no-disturbance buffer shall be determined by the biologist in coordination with USFWS and CDFW and will depend on the level of noise or construction activity, the level of ambient noise in the vicinity of the nest, and line-of-sight between the nest and disturbance. The biologist shall delimit the buffer zone with construction tape or pin flags. The no-disturbance buffer will remain in place until after the nesting season (to be lifted August-September) or until the biologist determines that the young birds have fledged. A report shall be prepared and submitted to the Carmichael Water District, USFWS, and CDFW following the fledging of the nestlings to document the results.

3.6 CULTURAL AND PALEONTOLOGICAL RESOURCES

3.6.1 SETTING

Archeological Overview

Three time periods were well represented in archaeological assemblages in the general vicinity of the Action Area. These assemblages are discussed in detail in Moratto (1984), in the Cultural Resources Report (AES, 2014), and summarized here.

The **Windmiller Pattern** (3,000 to 1,000 BC) of archaeological assemblages included an increased emphasis on acorn use as well as a continuation of hunting and fishing activities. Ground and polished charmstones, twined basketry, baked-clay artifacts and worked shell and bone were hallmarks of Windmiller culture. Widely ranging trade patterns brought goods in from the Coast Ranges and trans-Sierran sources as well as closer trading partners. Distinctive burial practices identified with the Windmiller Pattern also appeared in the Sierra foothills, indicating possible seasonal migration into the Sierra.

The **Berkeley Pattern** (1,000 BC to AD 500) represented a greater reliance on acorns as a food source than was seen previously. Distinctive stone and shell artifacts distinguished it from earlier or later cultural expressions. The Berkeley Pattern appears to have developed in the Bay Area and was spread through the migration of Plains Miwok Indians.

The **Augustine Pattern** (AD 500 to Historic Era) may have been stimulated by the southern migration of Wintuan people from north of the Sacramento Valley. Their culture was marked by increasing populations resulting from more intensive food procurement strategies, as well as a marked change in burial practices, increased trade activities and a well-defined ceramic technology.

Ethnographic Setting

Ethnographically, the Valley Nisenan occupied the project vicinity. In the valley region, the triblet, consisting of a primary and a few satellite villages, served as the basic political unit (Moratto, 1984). Permanent settlements could range up to several hundred people strong, living in earthen, tule, grass, or bark structures. These settlements were concentrated on raised ground near water. Valley Nisenan territory was divided into three triblet areas each populated with several large villages (Wilson and Towne, 1978).

Valley Nisenan people followed a seasonal round of food gathering, as did most California Indians. The wide variety of food resources available was exploited year round, but hunting and gathering activities were at their most intense in late summer and early fall. Food staples included acorns, buckeyes, pine nuts, hazelnuts, various roots, seeds, mushrooms, greens, berries, and herbs. Game, roasted, baked, or dried, included mule deer, elk, antelope, black bear, beaver, squirrels, rabbits, and other small animals and insects. Salmon, sturgeon, and suckers, as well as freshwater shellfish were all caught and eaten (Wilson and Towne, 1978).

Euro-American contact with the Nisenan began with infrequent excursions by Spanish explorers and Hudson Bay Company trappers traveling through the Sacramento-San Joaquin Valley in the early 1800s. The malaria epidemic of 1833 decimated the Valley Nisenan population, killing an estimated 75 percent of the tribesmen. The influx of Europeans during the gold rush era further reduced the population due to disease and violent relations with the miners.

History

Early Settlement

The earliest Euro-Americans to venture into the project region included Gabriel Moraga and a group of Spanish explorers in 1806–1808 who ventured into the vicinity of Sacramento, and fur trappers and explorers associated with the Hudson's Bay Company in the 1820s. Jedediah Smith, also with Hudson's Bay Company at the time, led a group of trappers along the edge of the foothills to the American River in search of a pass over the Sierra Nevada in 1826. Kit Carson and John C. Fremont crossed the mountains near Lake Tahoe and descended to Sutter's Fort traveling along the South Fork of the American River in 1844. These expeditions, however, had little lasting impression on the landscape or the native inhabitants of the region.

Historic-era developments in the project site vicinity appear to have been few prior to the discovery of gold at Sutter's Mill in El Dorado County and the ensuing Gold Rush. The northern portion of the project site was originally part of the Rancho San Juan Mexican land grant – 19,983 acres granted to Joel Dedmond and sold to Hiram Grimes in 1847 (Diseño del Rancho San Juan, 1860).

The southern portion of the project site was originally part of the *Rancho Rio de los Americanos* Mexican land grant – 35,500 acres granted to William Leidesdorff and purchased by Joseph L. Folsom in 1848 after Leidesdorff's death (Hoover et al., 1990). This grant extended from the eastern border of John Sutter's New Helvetia settlement (east of Sacramento) along the south bank of the American River to the western edge of present-day Folsom.

Gold Rush Period

During the Gold Rush of 1848–1849 and the following years, local settlement and development activity skyrocketed and rich mining districts such as Folsom, Coloma, Shingle Springs, and Placerville were heavily worked and gave rise to thriving communities still in existence today. Following the discovery of gold at Coloma in January 1848, mining camps along the American River sprang up as numerous fortune-seekers traversed the area between Sacramento and the Sierra Nevada foothills.

Early mining focused on the gravels and sands of the American River, Alder Creek, and numerous waterways within the project site. Mining camps arose along these waterways and river bars, including "Negro Bar" where African-American miners settled and started working local gravels as early as 1849. By 1850, the population of Negro Bar had reached 336, only to double again by the following year. However, flooding in 1852 forced the settlement to move east and above the river on bluffs at the site of present-day Folsom (Hoover et al., 1990).

Mining in the region suffered from only a seasonal availability of enough water to work large claims and wash the placer gold from the local gravels. Although small individual operators could profitably work their claims in the area early on, large-scale mining had to wait until an extensive water-conveyance system could be built. By the mid-1850s, mining operations had expanded well beyond simple small-scale operations to placer mining on an industrial scale.

Later Period: Large-Scale Mining

As individual miners and small operations began to be phased out with large companies consolidating claims, access to the deeper and/or more extensive gold deposits required the use of ground sluicing, low and high-pressure "hydraulicking", and drifting, all of which required the movement of large quantities of water. The most prominent firm working in the project site and vicinity following the initial "rush" was the Natoma Mining Company, whose ditch systems provided steady water supplies from the American River to the mining districts in and around present-day Folsom and the project vicinity.

By the turn of the century, the smaller drift and ground sluicing operations in the Folsom region had been primarily replaced by the larger dredging operations. The Natoma Mining Company, reorganized as Natomas Consolidated of California, acquired all of the smaller dredging operations by 1916 and operated until 1962, with a short period during World War II when operations were suspended.

The northern portion of the project area is located in the community of Carmichael, California. Carmichael was named for Daniel Carmichael, who came to California in 1885. After several years doing various jobs, he organized a real estate firm and bought portions of former Rancho lands to sell as housing lots. Carmichael was active in politics, eventually serving as mayor of Sacramento from 1917 to 1919 (Carmichael Chamber of Commerce, 2013).

The southern, larger, portion of the project's Area of Potential Effects (APE) is in the City of Rancho Cordova, which began as a Gold Rush-era crossroads. As miners left Sacramento, they travelled on a number of routes to get to the gold diggings in Folsom and beyond. A series of way stations sprang up along the various routes, and one of these, Mills Station, formed the seed of Rancho Cordova on the Old Placerville Road, now called White Rock Road. Planted with vineyards and orchards in the 19th century, in the second half of the 20th century much of the local employment has come from Mather Air Force Base and Aerojet.

Record Search

An AES archaeologist consulted pertinent historical documents and maps, and reviewed documents provided in a records search (NWIC File No. SAC-14-122) completed at the North Central Information Center (NCIC) on October 7, 2014. The NCIC is the official repository for archaeological and historical records for the State. The record search area included the project APE plus an additional half mile radius around this boundary, and included a review of historic U.S. geological survey maps, Government Land Office Plat maps, library sources, and the following:

- National Register of Historic Places (updates through June 2010);
- California Register of Historical Resources (updates through June 2010);
- California Historical Landmarks (updates through June 2010);
- California Inventory of Historic Resources (California Department of Parks and Recreation 1976); and
- General Land Office Plat maps, historic U.S. Geological Survey (USGS) quadrangles.

The NCIC records search revealed six previously recorded cultural resources within a 0.5-mile radius of the APE, which is the project site and an approximately 50-foot buffer. Only one previously recorded cultural resource, P-34-335, which contains wide-spread mining tailings related to the Folsom Mining District, is located within the APE (AES, 2014). The records search also reported nine previously conducted cultural resource surveys within a 0.5-mile radius of the APE, three of which included portions of the project area (AES, 2014).

Native American Heritage Consultation

On September 18, 2014, AES sent a letter to the Native American Heritage Commission (NAHC) requesting a Sacred Lands File search and a list of Native American contacts who may have information about the area. The NAHC responded in a letter dated October 3, 2014 that the Sacred Lands file does not indicate the presence of Native American cultural resources in the project area, but that this does not indicate they are absent (AES, 2014). The NAHC provided a list of Native American organizations and individuals that may have information about the area. Letters were sent to the individuals provided by the NAHC on October 13, 2014; three responses were received. On October 16, Andrew Ramey, Tribal Council Member of the Ione Band of Miwok Indians, replied that the Cultural Committee had no

information to offer, but stated that the area was considered highly sensitive for cultural remains and asked to be apprised of project progress. On October 17, Anthony Burris asked about the project schedule. On November 24, 2014, Daniel Fonseca of the Shingle Springs Rancheria requested that the Shingle Springs Band of Miwok Indians be added as a consulting party. On December 22, 2014, Gene Whitehouse, Chairman of the United Auburn Indian Community of the Auburn Rancheria asked for a site visit as well as copies of any archaeological reports or environmental documents prepared for the project so that they can comment on potential impacts and proposed mitigation measures. To date, no other responses have been received.

Field Survey

AES archaeologist Charlane Gross, M.A., RPA conducted a survey of the APE on October 21, 2014. The survey area included the APE and a buffer of at least 50 feet around the APE, using intensive examination of the areas closest to the American River and switching to a meandering transect south of the river along Rossmoor Drive. On the north side of the river, the entire project APE has been disturbed by previous infrastructure construction, including sewer lift station construction, culvert installation, large-diameter pipes, steps, and embankment structures. The river bank is extremely steep, and thick vegetation made it impossible to examine the banks for evidence of buried cultural strata. Ground surfaces were approximately 50 percent visible, but no cultural resources were identified.

South of the river, where the old Ranney pipeline emerges from the water, the structure is covered in water-worn cobble mine tailings for protection, and river banks are shallow on this lower side of the river. The immediate surrounding areas have been graded and contoured either by deposition of mine tailings or by construction of a parking lot and boat ramp; the area immediately adjacent to the river's edge is thickly vegetated with grasses and shrubs. South of these facilities, the length of Rossmoor Drive has flattened mine tailings spread widely to either side, with some contouring and potentially undisturbed tailings in isolated locations. Visibility in this area was excellent, close to 90 percent, but no cultural resources, other than the dispersed tailings, were observed.

Beginning at Coloma Road and continuing northward on Rossmoor Drive, approximately half of the distance to the American River consisted of a fully developed residential landscape, offering zero native ground surface visibility, and therefore no cultural resources were observed in this area.

Site P-34-335/CA-SAC-308H was relocated during the field survey; this site consists of wide-spread mining tailings related to the Folsom Mining District found on both sides of the American River. The site includes massive dredge tailings and associated features, such as prospect pits, ditch systems, earthen dams, and settling ponds. The accumulated tailings in the region once covered about 28 square miles, accumulated over the course of 60 years (Lindström, 1995). Since the close of mining in the early 1960s, much of the landscape has been graded for residential and commercial re-use, including in the proposed project vicinity. Recorded in various studies since 1969, the Folsom Mining District has generally been examined in smaller contexts for specific projects, and some of these smaller sub-districts have been recommended eligible to the National Register of Historic Places (NRHP). However, none of these include the portions of P-34-335 in the project APE.

Paleontology Setting

Surficial geology in the site vicinity is mapped as sedimentary rocks of the Quaternary Period, including Dune sand, Turlock Lake Formation, Modesto-Riverbank Formations, and mine and dredge tailings (CDMG, 1981). The University of California Museum of Paleontology (UCMP) has 126 fossil specimens recorded in Sacramento County; many of these are documented along the major riverbanks of the area (UCMP, 2014). No paleontological resources or unique geologic features were documented during the cultural resources field survey (AES, 2014).

3.6.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

CULTURAL RESOURCES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Question A

There is one historic-period resource (P-34-335/CA-SAC-308H) within the portions of the APE south of the American River; this resource is dredge mine tailings that cover thousands of acres in the Sacramento Valley and along the American River and form a ubiquitous landscape. A portion of the pipeline construction will run through the tailings on the south bank of the American River between the bank and the edge of the American River Parkway. The tailings within the project vicinity will be leveled, contoured, or otherwise redistributed, largely within the existing roadway that has already been paved over and graded. This additional temporary disturbance will not constitute an adverse effect, as post-construction restoration will return the tailings surface to its current, previously disturbed, appearance. Therefore, this is a less-than-significant impact to cultural or historical resources, and no mitigation is required. **Less than Significant.**

Questions B – D

Significant impacts to cultural resources typically occur when important sites, features, or artifacts are lost, damaged, or destroyed without appropriate mitigation such as recordation or data recovery. Displacement or destruction of these resources will result in the loss of important information and connections to past events, people, and cultures. As noted above, one cultural resource was identified within the APE as a result of the records search of the NCIC, although it would not be adversely impacted by the Proposed Project.

There is always a possibility that a significant subsurface cultural resource may exist in the project site, as archeological sites may be buried with no surface manifestation. In addition, there is a remote possibility that an unanticipated discovery of human remains could occur. With implementation of **Mitigation Measure CR-1**, impacts to archeological resources in the case of an inadvertent discovery would be reduced to less than significant. Although unlikely given the site geology, there is the chance that paleontological resources could be impacted by the Proposed Project; however, with implementation of **Mitigation Measure CR-2**, these impacts would be less than significant. With implementation of **Mitigation Measure CR-3**, impacts to human remains in the case of inadvertent discovery would be reduced to less than significant. **Less than Significant with Mitigation.**

Cumulative Impacts

Potential cumulative projects in the vicinity of the project area have the potential to impact cultural resources. Archaeological and historic resources are afforded special legal protections designed to reduce the cumulative effects of development. As discussed above, no known protected archaeological or historical resources would be significantly impacted by the Proposed Project. Recommended mitigation provides for the protection of unanticipated discoveries during ground disturbing activities. Therefore, the Proposed Project's incremental contribution to cumulative impacts to cultural resources is considered less than significant with mitigation. **Less than Significant with Mitigation.**

3.6.3 MITIGATION MEASURES

CR-1 The District shall require that, in the event of any inadvertent discovery of archaeological resources, all such finds shall be subject to PRC 21083.2 and CEQA *Guidelines* 15064.5. All work within 50 feet of the find will be halted until a qualified professional archaeologist can evaluate the significance of the find in accordance with NRHP and California Register of Historical Resources (CRHR) criteria. Work shall not resume in the vicinity of the find until any required mitigation has been completed.

CR-2 If vertebrate fossils are discovered during project activities, all work shall cease within 100 feet of the find until a qualified professional paleontologist as defined by the Society of Vertebrate Paleontology's Conformable Impact Mitigation Guidelines Committee (2011) can assess the nature and importance of the find and recommend appropriate treatment. The District will also be notified of the discovery and the qualified professional paleontologist's opinion within 48 hours of the initial finding. Treatment may include preparation and recovery of fossil materials, so that they can be housed in an appropriate museum or university collection, and also may include preparation of a report for publication describing the finds. Project activities shall not resume until

after the qualified professional paleontologist has given clearance and evidence of such clearance has been submitted to the District.

CR-3 If human remains are uncovered, compliance with Section 15064.5 (e) (1) of the CEQA Guidelines and Public Resources Code Section 7050.5 will be required. All project-related ground disturbances within 100 feet of the find shall be halted until the Sacramento County coroner has been notified in accordance with California Health and Safety Code Section 7050. If the coroner determines that the remains are Native American, the coroner will ask the NAHC to identify a Most Likely Descendant, who will work with the construction contractor, agency officials, and a qualified professional archaeologist to determine an appropriate avoidance strategy or other treatment plan. Project-related ground disturbance in the vicinity of the find shall not resume until the process detailed in Section 15064.5 (e) has been completed.

3.7 GEOLOGY AND SOILS

3.7.1 SETTING

Regional Geology

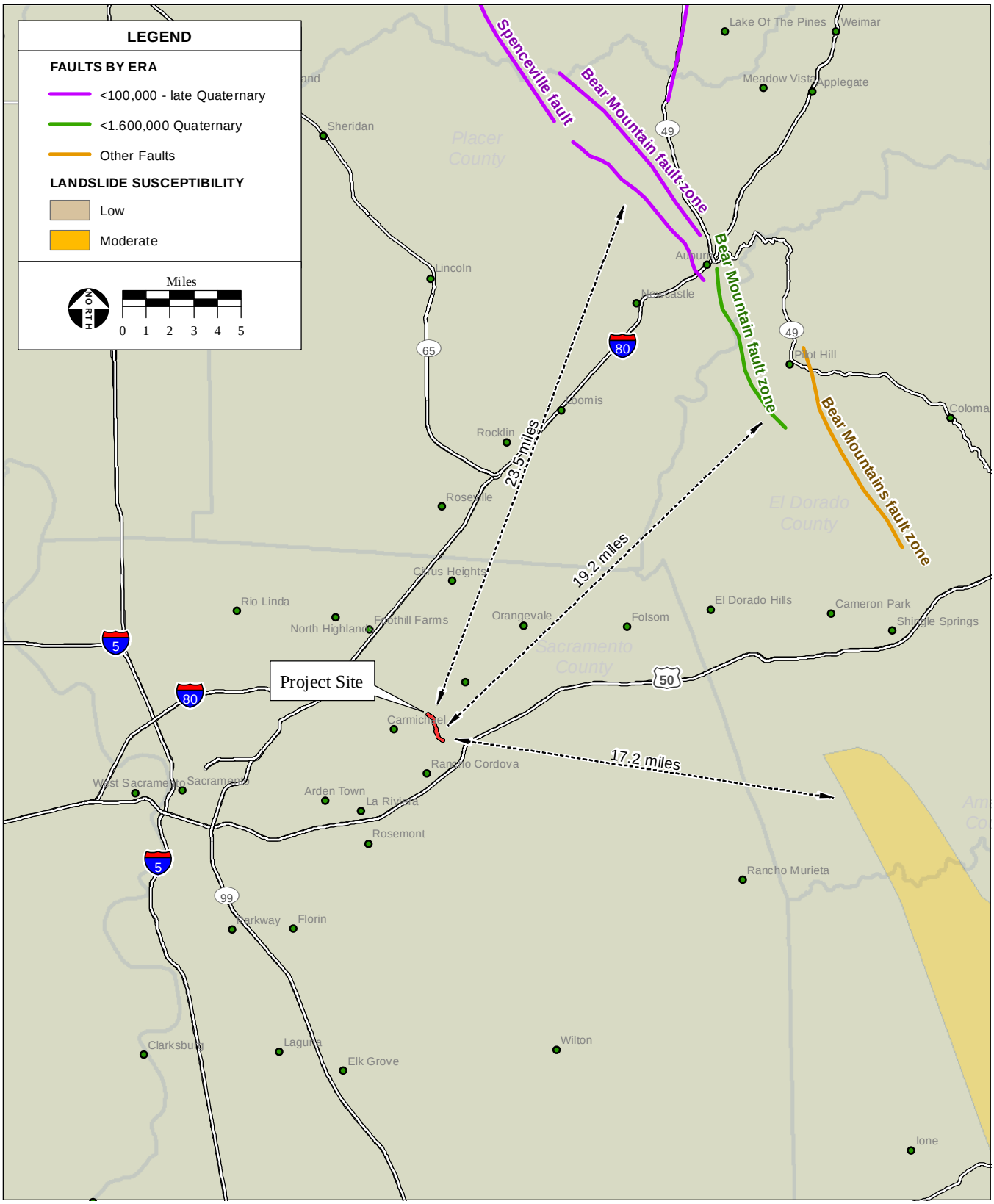
Carmichael is located in the western foothills of the Sierra Nevada. It is a transitional area between the Great Valley and Sierra Nevada Geomorphic Provinces of California. Although the surrounding region has many hills, the project site is located on the American River floodplain and is relatively flat. Elevations at the project site range from 50 feet above mean sea level (amsl) to 100 feet amsl. The bedrock in the site vicinity is mapped as sedimentary rocks of the Quaternary Period, including Dune sand, Turlock Lake Formation, Modesto-Riverbank Formations, and mine and dredge tailings (CDMG, 1981).

Regional Faults

Although earthquake faults are a major hazard for development in California, there are no major active faults that transect Sacramento County (Sacramento County, 2011). As shown on **Figure 11**, the nearest fault is part of the Bear Mountain fault zone, located 19.2 miles northeast of the project site. An active fault is a fault that shows displacement within the last 11,000 years (the Holocene epoch), and therefore, is considered more likely to generate a future earthquake than a fault that has not shown signs of recent activity. A potentially active fault is one that has shown activity in the last 2.5 million years (the Quaternary Period). A fault that the California Geological Survey (CGS) determines to be sufficiently active and well-defined is zoned as an earthquake fault zone according to mandates of the Alquist-Priolo Earthquake Fault Zoning Act of 1972. There are no active faults in the vicinity of the project site. The faults in the Bear Mountain fault zone to the northeast of the project site are potentially active (**Figure 11**).

Seismicity

According to the CGS Index to Earthquake Fault Zone Maps, the project site is not located in a designated Fault-Rupture Hazard Zone, as identified under the Alquist-Priolo Earthquake Fault Zoning Act (CGS, 2014). To estimate the probability of future earthquake events, the USGS considered potential sources of an event on the fault systems in the region. Based on a combined probability of the fault systems and background earthquakes of the region, there is a 30 percent chance of a magnitude 5.0 or larger earthquake occurring at the project site within the next 50 years (USGS, 2010).



SOURCE: USGS Earthquake Hazards Program, 2007; AES, 2014

Figure 11
Regional Faults

Soils

The project sites contain the soils shown on **Figure 12** and described in **Table 3-8**.

TABLE 3-8
SOILS ON THE PROJECT SITE

Soil	Taxonomic Class	Hydrologic Soil Group (Drainage)	Shrink-Swell Potential	Erosion Potential	Corrosion of Concrete	Corrosion of Steel
Americanos-Urban land complex, 0 to 2 percent slopes	Fine-silty, mixed, thermic Mollic Haploxeralfs	B (Soils having a moderate infiltration rate when thoroughly wet; moderately well drained; moderate rate of water transmission.)	Low	Slight	Low	Low
Kasberg-Fiddyment-Urban land complex, 2 to 15 percent slopes	Loamy, mixed, thermic, shallow Typic Durochrepts	D (Soils having a very slow infiltration rate/ high runoff potential when thoroughly wet; very slow rate of water transmission.)	Low	Slight	Low	Low
Rossmoor fine sandy loam, 0 to 2 percent slopes	Coarse-loamy, mixed, thermic Fluventic Haploxerolls	A (Soils having a high infiltration rate/ low runoff potential) when thoroughly wet; well drained to excessively drained sands or gravelly sand; high rate of water transmission.)	Low	Slight	Low	Low
Xerofluvents, 0 to 2 percent slopes, flooded	Xerofluvents	N/A	N/A	N/A	N/A	N/A
Xerolls, 30 to 70 percent slopes	Xerolls	N/A	N/A	N/A	N/A	N/A
Xerorthents, dredge tailings, 2 to 50 percent slopes	Xerorthents	A (Soils having a high infiltration rate/ low runoff potential) when thoroughly wet; well drained to excessively drained sands or gravelly sand; high rate of water transmission.)	Low	Severe	N/A	N/A
Source: NRCS, 2014						

Expansive soils are largely comprised of clays, which greatly increase in volume when water is absorbed and shrink when dried; this action is called “shrink-swell potential.” Expansive soils are of concern because building foundations may rise during the rainy season and fall during the dry season in response to the clay's action; this can cause structural distortion. The soils on the project sites are low shrink-swell potential (NRCS, 2014).

Liquefaction and landslides can increase damage from ground shaking. Liquefaction changes water-saturated soil to a semi-liquid state, removing support from foundations and possibly causing buildings to sink. The CGS maps do not map any of the project sites as being in liquefaction or landslide zones (CGS, 2014). However, given the high water table in the area and the higher fraction of sand and silt, there may be some risk of liquefaction in the event of an earthquake.

SOURCE: AEX Aerial Photograph, 6/15/2007; AES, 2014

Figure 12
Soil Types

3.7.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

GEOLOGY & SOILS	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known Fault?	☐	☐	☒	☐
b) Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving seismic-related ground failure, including strong seismic ground shaking?	☐	☐	☒	☐
c) Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
d) Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving landslides?	☐	☐	☒	☐
e) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
f) 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?	☐	☐	☒	☐
g) 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?	☐	☐	☒	☐
h) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Questions A – D, F, and G

There are no mapped surface faults on the project site that would have the potential to rupture. There are no active faults in the vicinity of the project site, although the faults in the Bear Mountain fault zone located 19.2 miles northeast of the project site are potentially active. The project site is not mapped within any landslide or liquefaction zones, and the Proposed Project would not be located on an unstable geologic unit or soil. The soils on the project site have low shrink-swell potential; no project components would be located on expansive soils. Therefore, the Proposed Project would not expose people or structures to substantial adverse effects from surface fault rupture, ground shaking, liquefaction, landslides, unstable geologic units or soils, or expansive soils. This less-than-significant impact would be further minimized through implementation of **Mitigation Measure GS-1**, which requires the project contractor comply with all recommendations contained within the site-specific Geotechnical Investigation conducted by Kleinfelder (2014). **Less than Significant.**

Question E

Construction of the Proposed Project would involve minor earth moving activities, trenching, boring, removal of abandoned structures, as well as installation of project components. Construction would result in the temporary disturbance of soil and would expose disturbed areas to potential storm events, which could generate accelerated runoff, localized erosion, and sedimentation.

Construction activities could expose soil to wind erosion effects that could adversely affect both on-site and nearby soils and the revegetation potential of the area. Upon completion of the Proposed Project, revegetated areas or paved areas (within the existing roadways) would eventually cover soils exposed during construction, and no long-term erodible soils would be created as a result of the Proposed Project.

Construction of the Proposed Project would be required to comply with the California General NPDES Permit for construction activities, as discussed in **Section 4.10**. Implementation of **Mitigation Measure GS-2** would ensure that potential impacts would be reduced to a less-than-significant level. **Less than Significant with Mitigation.**

Question H

The Proposed Project does not require wastewater disposal or the use of septic systems. **No Impact.**

Cumulative Impacts

All projects constructed in this area would be subject to seismic hazards such as ground shaking and liquefaction. Construction of other projects in the area would have the potential to contribute to erosion. These impacts are fully mitigable with implementation of construction-period erosion control programs and with standard seismic safety measures incorporated in design. The Proposed Project will incorporate the standard mitigation measures below to ensure a less than significant effect. No significant cumulative impacts would occur. **No Impact.**

3.7.3 MITIGATION MEASURES

GS-1 The project applicant shall comply with all recommendations contained within the site-specific Geotechnical Investigation conducted by Kleinfelder (2014) and attached here as **Appendix C**.

GS-2 The District shall comply with the SWRCB NPDES General Permit. The SWRCB requires that all construction sites have adequate control measures to reduce the discharge of sediment and other pollutants to streams to ensure compliance with Section 303 of the CWA. To comply with the NPDES permit, the District shall file a Notice of Intent with the SWRCB and prepare a SWPPP prior to construction, which includes a detailed, site-specific listing of the potential sources of stormwater pollution; pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills) including a description of the type and location of erosion and sediment control BMPs to be implemented at the project site; and a BMP monitoring and maintenance schedule to determine the amount of pollutants leaving the Proposed Project site. A copy of the SWPPP must be current and remain on the project site. Control measures are required prior to and throughout the rainy season. Water quality BMPs identified in the SWPPP could include, but are not limited to, the following:

- Areas where ground disturbance would occur shall be identified in advance of construction and limited to only approved areas.
- All equipment maintenance and cleaning shall be confined to staging areas. See **Figure 3** for the location of potential staging areas.
- All supervisory construction personnel shall be informed of environmental concerns, permit conditions, and final project specifications. Said personnel will be responsible for instructing all on-site work to meet the requirements of the SWPP including making sure all work is conducted outside of protected trees' drip lines to the extent possible.
- Restore disturbed areas to pre-construction contours to the fullest extent possible.
- Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) shall be employed for disturbed areas.
- Salvage, store, and use the highest quality soil for native re-vegetation/seeding.
- Leave drainage gaps in topsoil and spoil piles to accommodate surface water runoff.
- Sediment control measures shall be in place prior to the onset of the rainy season and will be maintained until disturbed areas have been re-vegetated. Erosion control structures must be in place and operational at the end of each day if work activities are to occur during the rainy season.
- Fiber rolls shall be placed along the perimeter of disturbed areas to ensure sediment and other potential contaminants of concern are not transported off-site or to open trenches. Locations of fiber rolls will be field adjusted as needed and according to the advice of the certified SWPPP inspector.
- Vehicles and equipment stored in the construction staging area shall be inspected regularly for signs of leakage. Leak-prone equipment will be staged over an impervious surface or other suitable means will be provided to ensure containment of any leaks. Vehicle/equipment wash waters or solvents will not be discharged to surface waters or drainage areas.
- During the wet season (October 1 through April 30) identified in Section 11 of the Sacramento County Improvement Standards, soil stockpiles and material stockpiles will be covered and protected from the wind and precipitation. Plastic sheeting will be used to cover the stockpiles and straw wattles will be placed at the base for perimeter control.
- All contractors shall immediately control the source of any leak and immediately contain any spill utilizing appropriate spill containment and countermeasures. All leaks and spills shall be

reported to the designated representative of the lead contractor and shall be evaluated to determine if the spill or leak meets mandatory SWPPP reporting requirements. Contaminated media shall be collected and disposed of at an off-site facility approved to accept such media.

- Construction activities shall be scheduled to minimize land disturbance during peak runoff periods and to the immediate area required for construction. Soil conservation practices shall be completed during the fall or late winter to reduce erosion during spring runoff. Existing vegetation will be retained where possible. To the extent feasible, grading activities shall be limited to the immediate area required for construction.
- Topsoil removed during construction shall be carefully stored and treated as an important resource. Berms shall be placed around topsoil stockpiles to prevent runoff during storm events.
- Disturbed areas will be re-vegetated after completion of construction activities.

3.8 GREENHOUSE GAS EMISSIONS

3.8.1 SETTING

Climate Change

Global climate change is a change in the average weather of the Earth, which can be measured by wind patterns, storms, precipitation, and temperature. It is exacerbated by greenhouse gases (GHGs), which trap heat in the atmosphere (thus the "greenhouse" effect). GHGs include carbon dioxide, methane, and nitrous oxide, and are emitted by natural processes and human activities.

Scientific evidence suggests that emissions from human activities, such as electricity production and vehicle emissions, have elevated the concentration of these gases in the atmosphere, and are increasing the rate and magnitude of climate change to a degree that could present hazardous conditions. Potential adverse effects of global warming include a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels, and changes to ecosystems and the natural environment. Climate change has the potential to reduce the snow packs in the Sierra Nevada, cause the sea level to rise, and increase the intensity of wildfires and storms (IPCC, 2014).

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, city, and virtually every individual on Earth. A project's GHG emissions are at a micro-scale relative to global emissions, but could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact.

Regulatory Background

The following regulatory background gives context to the issues of climate change and importance to reducing GHG in California:

Assembly Bill 32

Signed by the California State Governor on September 27, 2006, Assemble Bill (AB) 32 codifies a key requirement of Executive Order (EO) S-3-05, specifically the requirement to reduce statewide GHG emissions to year 1990 levels by the year 2020. AB 32 tasks CARB with monitoring State sources of GHGs and designing emission reduction measures to comply with the law's emission reduction requirements.

AB 32 required that CARB prepare a comprehensive "scoping plan" that identifies all strategies necessary to fully achieve the required 2020 emissions reductions. In early December 2008, CARB released its scoping plan to the public and on December 12, 2008, the CARB approved the scoping plan.

The scoping plan calls for an achievable reduction in California's carbon footprint. Reduction of GHGs emissions to 1990 levels are proposed, which equates to cutting approximately 30 percent from estimated GHG emission levels projected in 2020, or about 15 percent from today's levels. The scoping plan relies on existing technologies and improving energy efficiency to achieve the 30 percent reduction in GHG emission levels by 2020. The scoping plan provides the following key recommendation to reduce GHG emissions:

- Expand and strengthen existing energy efficiency programs as well as building and appliance standards;
- Achieve a statewide renewable energy mix of 33 percent;
- Develop a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establish targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopt and implement measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.

In March 2014, CARB published the "First Update to the Climate Change Scoping Plan" (Update), which builds upon the initial Scoping Plan with new strategies and recommendations. The Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments (CARB, 2014b).

CEQA Guidelines

January 2010 amendments to the CEQA Guidelines provide the following direction for consideration of climate change impacts in a CEQA document:

- The determination of significance of GHG emissions calls for a careful judgment by the lead agency;
- A model or methodology shall be used to quantify GHG emissions resulting from a CEQA project;
- Significance may rely on qualitative analysis or performance based standards;
- The CEQA document shall discuss regional and/or local GHG reduction plans;

- A CEQA document shall analyze GHG emissions if they are cumulatively considerable;
- A description of the effects of climate change on the environment shall be included in CEQA documents;
- A CEQA document shall contain mitigation measures, which feasibly reduce GHG emissions.
- GHG analysis in a CEQA document may be Tiered or Streamlined;
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long term commitment to AB 32 implementation.

3.8.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

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

Questions A and B

Construction

Construction of the Proposed Project would emit GHG from the combustion of diesel fuel in heavy equipment. The SMAQMD provides a construction GHG significance threshold of 1,100 metric tons per year. Emissions are expressed in annual metric tons of CO_2 equivalent units of measure (i.e., $MTCO_2e$), based on the global warming potential of the individual pollutants. As shown in **Table 3-9**, GHG emissions associated with construction of the Proposed Project are estimated to be 618 $MTCO_2e$. Construction GHG emissions are a one-time release and are typically considered separate from operational emissions, as global climate change is inherently a cumulative effect that occurs over a long period of time and is quantified on a yearly basis.

TABLE 3-9
ESTIMATION OF CONSTRUCTION RELATED GHG EMISSIONS

Construction Equipment	Hours Used (hours/day)	CO_2 Emission Factors (g/bhp/hr)	CO_2 Emission (metric tons/year)
Air Compressor (jackhammer)	8	536.20	187.88
Other Material Handling Equipment	6	536.30	78.46
Genset	8	536.00	97.29
Other Construction Equipment	6	536.20	84.83
Concrete Saw	2	529.70	22.86
Concrete Mixer	6	530.20	5.85
Tractors/Loaders/Backhoes	7	690.80	64.00
Welder	4	536.20	16.21
Employee Trips		415.49[1]	60.66
Total GHG Construction Emissions			618
SMAQMD Threshold			*1,100*
Exceed Threshold			**No**

[1] grams per mile
Source: CalEEMod Emission Factors, 2010; AES, 2014.

As shown in **Table 3-9**, construction-related GHG emissions would be less than the SMAQMD GHG threshold for construction of 1,100 MT CO_2e. Therefore, construction GHG emissions would not result in a significant impact to the environment and would not conflict with an applicable plan, policy, or regulation. This potential impact and is considered less-than-significant. **Less than Significant.**

Operation

Operational activities of the Proposed Project would consist of periodic maintenance, which would not substantially increase over current maintenance practices of the culvert and other pipelines in the area. Operation of the Proposed Project would not increase GHG emissions over current conditions that would trigger the SMAQMD operational threshold of 1,100 MTCO_2e per year. This is considered a less-than-significant impact. **Less than Significant.**

Cumulative Impacts

The Proposed Project would not create any significant new sources of GHG emissions; therefore, the project would not contribute to adverse impacts associated with cumulative GHG emissions. This impact is considered less than significant. **Less than Significant.**

3.8.3 MITIGATION MEASURES

None Required.

3.9 HAZARDS AND HAZARDOUS MATERIALS

3.9.1 SETTING

Definition of Hazardous Material

A material is considered hazardous if it appears on a list of hazardous materials prepared by a Federal, State, or local agency, or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in Title 22 of the California Code of Regulations (CCR) as:

> "A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed" (CCR, Title 22, Section 66260.10).

Regulatory Context

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) provides a Federal fund to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through various enforcement mechanisms, the EPA obtains private party cleanup orders and recovers costs from financially viable individuals and companies once a response action has been completed. Uncontrolled or abandoned hazardous-waste site identification, monitoring, and response activities in states are coordinated though the state environmental protection or waste management agencies.

Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) is a sub-agency of the CalEPA that regulates the generation, transportation, treatment, storage, and disposal of hazardous waste under the federal Resource Conservation and Recovery Act (RCRA) and the State Hazardous Waste Control Law. Both laws impose "cradle-to-grave" regulatory systems for handling hazardous waste in a manner that protects human health and the environment.

California Occupational Safety and Health Administration (Cal/OSHA)

Cal/OSHA assumes primary responsibility for developing and enforcing State workplace safety regulations. Cal/OSHA regulations concerning the use of hazardous materials in the workplace, as detailed in Title 8 of the CCR, include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that Material Safety Data Sheets (MSDSs) be available to employees and that employee information and training programs be documented.

Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) and the RWQCBs also regulate hazardous substances, materials, and wastes through a variety of State statutes, including the Porter Cologne Water Quality Control Act, Cal. Water Code §13000 et seq., and the underground storage tank cleanup laws. Cal. Health and Safety Code §§25280-25299.8. RWQCBs regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. Any person proposing to discharge waste within any region must file a report of waste discharge with the appropriate regional board. The Proposed Project is located within the jurisdiction of the Central Valley RWQCB.

Cortese List - Government Code Section 65962.5

The provisions in California Government Code § 65962.5 require the CalEPA to compile a database listing of hazardous waste facilities and other permitted activities within their jurisdiction. This database is collectively referred to as the "Cortese list." The sites for the list are designated by the SWRCB, the Integrated Waste Board, and the Department of Toxic Substances Control. The Cortese list is updated quarterly.

Project Area Database Searches

The Cortese list, maintained by the California DTSC, lists 516 hazardous waste facilities in the state of California. None of these occur within one mile (5,280 feet) of the project site (California DTSC, 2014).

In addition to the Cortese list, discussed above, the SWRCB GeoTracker database was accessed to determine if there are any hazardous materials sites in the vicinity of the project sites. According to the GeoTracker database, there are four hazardous materials sites in a one-mile radius around the project site. Three of these sites, all leaking underground storage tank (LUST) sites located along Coloma Road, are listed with the Cleanup Status of "Completed – Case Closed" (SWRCB, 2014). Only one site is listed as Open and still in remediation, meaning that cleanup is ongoing and monitoring is still occurring. This site is an Aerojet land disposal site that has been listed in the database since 1965 (SWRCB, 2014).

3.9.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

HAZARDS & HAZARDOUS MATERIALS	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☒	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard 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 within the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) 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?	☐	☒	☐	☐

Questions A – C

During construction, limited quantities of miscellaneous hazardous substances such as fuels, solvents, oils, and paint could potentially be used during installation of the new pipeline and replacement of the culvert. If properly used, stored, and disposed of, these materials would not be a hazard to people or the environment. The use of such materials during construction would be considered minimal and would not require these materials to be stored in bulk form. These impacts would be mitigated through implementation of **Mitigation Measures HM-1** through **HM-4**, which would reduce impacts to less-than-significant levels.

There are two schools, Williamson Elementary School and W.E. Mitchell Middle School, located within one mile of the project site. While construction may result in the emission of hazardous materials through accidental release or upset, implementation of **Mitigation Measures HM-1** through **HM-4** will ensure that the potential impact is reduced to a less-than-significant level. **Less than Significant with Mitigation.**

Question D

The project site is not located on a hazardous materials site listed pursuant to Government Code §65962.5. **No impact.**

Questions E and F

The project site is not located within two miles of a public airport or private airstrip. The project site is not located within an airport land use plan. **No impact**.

Question G

The County has an adopted emergency response plan (Sacramento County, 2012) and an emergency evacuation plan (Sacramento County, 2008b). The Proposed Project would not impede access by emergency vehicles in the case of an emergency, as the pipeline would be trenched underground and the stream restoration components are not within emergency access corridors. **No Impact.**

Question H

The California Department of Forestry and Fire Protection (CAL FIRE) has not mapped the project site as being within a very high fire hazard severity zone (CAL FIRE, 2008). However, there is still some risk of wildfire when doing construction work in open space areas that may contain dry brush. Therefore, **Mitigation Measures HM-3** and **HM-4** are recommended to ensure the impacts are less than significant. **Less than Significant with Mitigation.**

Cumulative Impacts

Development of the project in combination with other similar projects has the potential to increase the risk for accidental release of hazardous materials. Each individual project would require an evaluation as to potential hazardous materials risks and threat to public safety including risks associated with transportation/use/disposal of hazardous materials, accidental release of hazardous materials into the environment, hazards to sensitive receptors (including schools), and listed hazardous materials sites that could affect environmental conditions along roadway alignments. Each related project would be required

to follow local, State, and federal laws pertaining to hazards and hazardous materials. Through compliance with these laws, future potential cumulative impacts would be minimized. Therefore, through full compliance with local, State, and federal laws pertaining to hazardous materials, cumulative impacts would be considered less than significant and no mitigation is required. **Less than Significant.**

3.9.3 MITIGATION MEASURES

HM-1 Personnel shall follow written Standard Operating Procedures (SOPs) for filling and servicing construction equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving hazardous materials, shall include the following:

- Refueling shall be conducted only with approved pumps, hoses, and nozzles;
- Catch pans shall be placed under equipment to catch potential spills during servicing;
- All disconnected hoses shall be placed in containers to collect residual fuel from the hose;
- Vehicle engines shall be shut down during refueling;
- No smoking, open flames, or welding shall be allowed in refueling or service areas;
- Refueling shall be performed away from bodies of water to prevent contamination of water in the event of a leak or spill;
- Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents;
- Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with local, State, and Federal regulations;
- All containers used to store hazardous materials shall be inspected at least once per week for signs of leaking or failure. All maintenance and refueling areas shall be inspected monthly. Results of inspections shall be recorded in a logbook that would be maintained on site; and
- The amount of hazardous materials used in project construction and operation shall be consistently kept at the lowest volumes needed.

HM-2 If suspected soil contamination is encountered during excavation, all work shall be halted and a qualified individual, in consultation with the RWQCB, shall determine the appropriate course of action.

HM-3 During construction, staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a firebreak.

HM-4 Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles and heavy equipment.

3.10 HYDROLOGY AND WATER QUALITY

3.10.1 SETTING

Regulatory Context

Federal

Clean Water Act

The CWA (33 USC § 1251-1376), as amended by the Water Quality Act of 1987, is the major Federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Important sections of the Act are:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines. Under Section 303(d) of the CWA, the EPA publishes a list every two years of impaired bodies of water for which water quality objectives (WQOs) are not attained. Total Maximum Daily Loads (TMDLs) are established for contaminants of concern in order to ensure contamination levels decrease over time.
- Section 401 (Water Quality Certification) requires an applicant for any Federal permit that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the Act.
- Section 402 establishes the NPDES, a permitting system for the discharge of any pollutant (except for dredged or fill material) into waters of the United States. This permit program is administered by the SWRCB and is discussed in detail below.
- Section 404 establishes a permit program for the discharge of dredged or fill material into waters of the United States. This permit program is jointly administered by USACE and the EPA.

National Pollution Discharge Elimination System

Under Section 402(p) of the CWA, the EPA established the NPDES to enforce discharge standards from a variety of sources. Both point source and non-point-source pollution is covered under the NPDES. Dischargers in both categories can apply for individual discharge permits, or apply for coverage under the General Permits that cover certain qualified dischargers. Point source discharges come from "any discernible, confined, and discrete conveyance," including municipal and industrial wastewater, stormwater runoff, combined sewer overflows, sanitary sewer overflows, and municipal separated storm sewer systems. NPDES permits impose limits on the pollutants discharged based on minimum performance standards or the quality of the receiving water, whichever type is more stringent in a given situation.

CWD must comply with the requirements of the most recent version of the NPDES permit for Discharges of Storm Water Runoff associated with Construction Activity (currently Order No. 2009-0009-DWQ). . This permit regulates discharges from construction sites that disturb one acre or more of total land area. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance must comply with the provisions of this NPDES permit. The permitting process requires the development and implementation of an effective SWPPP. The project applicant must submit a Notice of Intent to the SWRCB to be covered by a NPDES permit and prepare the SWPPP prior to the beginning of construction. The SWPPP must include BMPs to reduce pollutants

and any more stringent controls necessary to meet water quality standards. Dischargers must also comply with water quality objectives as defined in the Central Valley Basin Plan. If Basin Plan objectives are exceeded, corrective measures would be required.

State

Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins (Basin Plan)

The Central Valley RWQCB adopted a Water Quality Control Plan, Fourth Edition (Revised October 2011), for the Sacramento and San Joaquin River Basins (Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan (CVRWQCB, 2011). Beneficial uses for the American River segment from Folsom Dam downstream to the Sacramento River are identified in the Basin Plan. These beneficial uses include: municipal and domestic supply, irrigation, service supply, hydropower generation, recreation (contact, canoeing, rafting, noncontact), freshwater habitat (warm and cold), migration habitat (warm and cold), spawning habitat (warm and cold), and wildlife habitat (CVRWQCB, 2011).

Local

Sacramento County General Plan

Policy CO-93 Discourage fill in the 100-year floodplain.

Policy CO-94 Development within the 100-year floodplain and designated floodway of Sacramento streams, sloughs, creeks or rivers shall be:

- Consistent with policies to protect wetlands and riparian areas; and
- Limited to land uses that can support seasonal inundation.

Policy CO-100 Encourage construction of structures for flood control and stormwater quality purposes using currently approved scientific methods to prevent erosion and stabilize the banks.

City of Rancho Cordova General Plan

Policy NR.5.5 Minimize erosion to stream channels resulting from new development in urban areas consistent with State law.

Action NR.5.5.4 – Require the use of best management practices to protect receiving waters from the adverse effects of construction activities, sediment and urban runoff consistent with current state law.

Sacramento County Municipal Code

Chapter 15.12 – Stormwater Management and Discharge Control. While stormwater runoff is one step in the natural cycle of water, human activities, including, but not limited to, agriculture, construction, manufacturing and the operation of an urban infrastructure, may result in undesirable discharges of pollutants and certain sediments. Such discharges may accumulate in local drainage channels and waterways and eventually may be deposited in the natural surface waters. The purpose of this chapter is

to protect and enhance the watercourses within the unincorporated area of the County, by controlling the contribution of urban pollutants to stormwater runoff which enters the County storm drain system in a manner consistent with the Federal Clean Water Act, the Porter-Cologne Water Quality Control Act and Municipal discharge Permit No. CAS082597, and by controlling pollutants that are discharged directly to natural surface waters.

Chapter 16.44 – Land Grading and Erosion Control. It is the intent of the Board of Supervisors in enacting this chapter to minimize damage to surrounding properties and public rights-of-way, the degradation of the water quality of watercourses, and the disruption of natural or County authorized drainage flows caused by the activities of clearing and grubbing, grading, filling and excavating of land, and sediment and pollutant runoff from other construction related activities, and to comply with the provisions of the County's National Pollutant Discharge Elimination System (NPDES) Permit Number, CA0082597, issued by the California Regional Water Quality Control Board (Regional Board).

16.44.050 Except as provided by Sections 16.44.060, 16.44.065 or 16.44.070, a Grading and Erosion Control Permit shall be required to (1) grade, fill, excavate, store or dispose of 350 cubic yards or more of soil or earthly material or (2) clear and grub 1 acre or greater of land within the unincorporated area of the County.

Improvement Standards

Section 11 – Erosion and Sediment Control.

11-2 **Erosion and Sediment Control Plan.** Improvement Plans shall include an Erosion and Sediment Control Plan, which shall be prepared and approved per the requirements of Chapter 16.44 of Title 16 of the Sacramento County Code, Land Grading and Erosion Control Ordinance. Erosion and Sediment Control Plans shall include erosion controls and sediment controls from this chapter to minimize erosion and the transport of sediments. These plans may be incorporated into the Grading Plans or on separate sheets for clarity. Additionally, landowners meeting the project area disturbance threshold shall obtain coverage under the SWRCB General Permit for Storm Water Discharges Associated with Construction Activity (Construction General Permit), prior to commencing construction activities. Coverage may be obtained by filing an NOI with a vicinity map and the appropriate fee with the SWRCB. Projects covered by the State's General Permit shall have an adequate SWPPP prepared, prior to commencing construction. SWPPPs may be submitted to the County Department of Water Resources for review and compliance assistance.

11-3 **Required BMPs.** The following BMPs shall be required on all projects:

A. Access points to the construction site shall have a Stabilized Construction Access (Section 11-7).
B. The preservation of existing vegetation shall be done in accordance with Preservation of Existing Vegetation (Section 11-5), and Silt Fence (Section 11-11).
C. Perimeter protection along property lines shall have Preservation of Existing Vegetation (Section 11-5), or Silt Fence (Section 11-11).

D. Slopes greater than 3 percent shall be temporarily seeded and slopes greater 3:1 (H:V) shall have Hydroseeding (Section 11-4) and Straw Mulch Stabilizers, Geotextiles, Plastic Covers, Straw Mulch Stabilizer, or Erosion Control Blankets (Section 11-1 0) installed.

E. The toe of all slopes shall have Silt Fence (Section 11-11) and/or Fiber Roll (Section 11-16).

F. Disturbed soil areas behind the curb or back of walk (or curb) shall have Straw Mulch (Section 11-15), Soil Binders (Section 11-6) or Geotextiles, Plastic Covers, and Erosion Control Blankets/Mats (Section 11-1 0) in conjunction with Hydroseeding (Section 11-4). Surface treatments shall extend to the greater of20 feet or to the top of slope.

G. Roadway Subgrades shall have Fiber Roll (Section 11-16), Silt Fence (Section 11-11), or Sediment Trap (Section 11 -8).

H. Dead end streets, to be extended in the future, shall have Preservation of Existing Vegetation (Section 11-5), Hydroseeding (Section 11-4), Sediment Trap (Section 11-8) or other applicable BMP to minimize the transport of sediment onto or from the improved surface.

I. Projects that include detention basins shall have a Sediment Basin (Section 11-9).

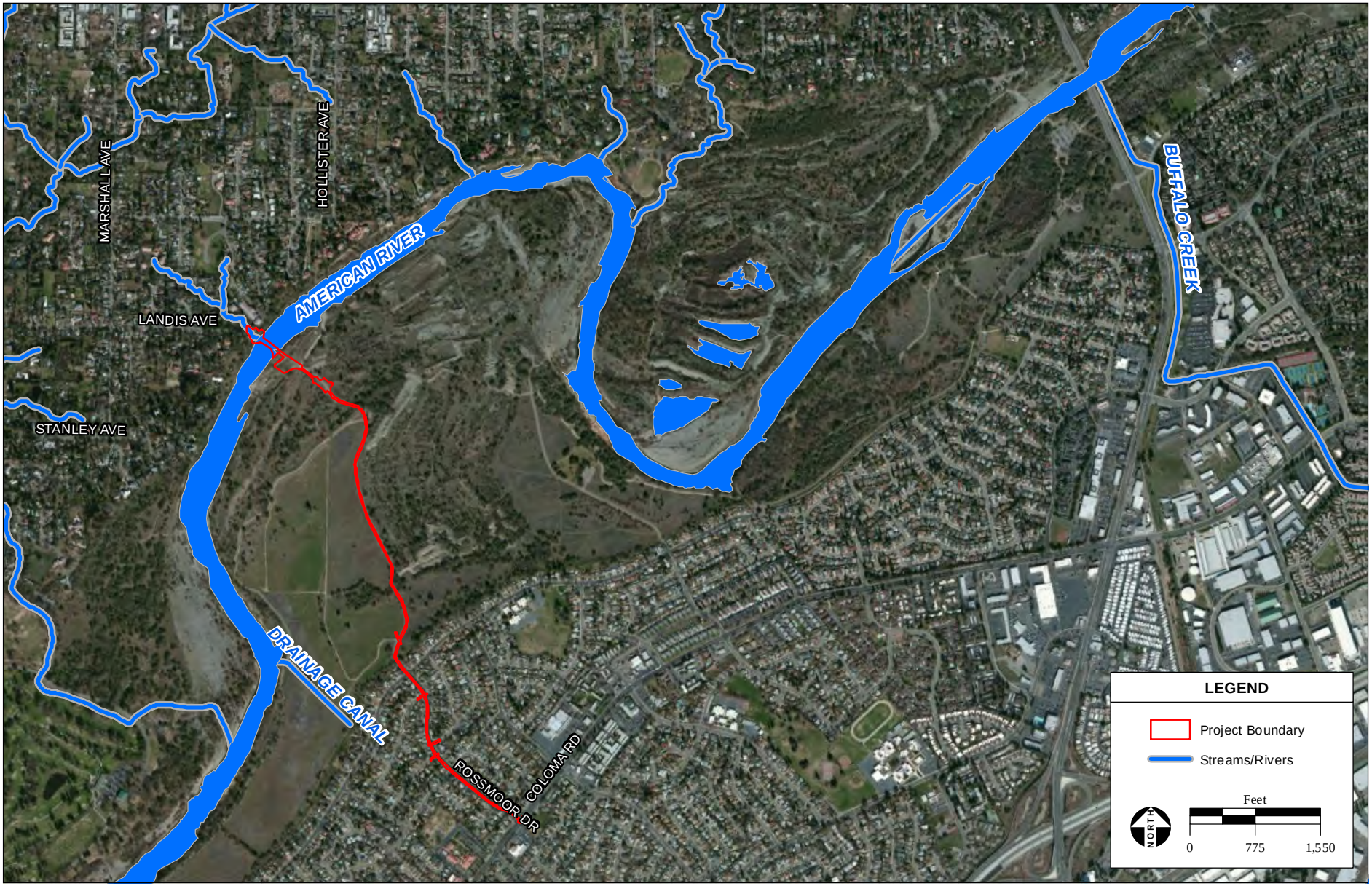
J. Place drainage inlet sediment BMPs at all storm drain inlets. BMPs shall include Inlet Sediment Control Barrier (Section 11-13), Inlet Filter Bag (Section 11- 14) and concrete stamps or expoxied plaquards (Detail9-35A).

K. Each construction site shall provide designated, paint and waste disposal locations as necessary.

L. A BMP installation schedule shall be included on the improvement plans. The schedule shall include the BMPs for both the wet season and the dry season.

Regional Hydrology

The project site is located in the Valley-American River hydrologic unit (HU), Coon American hydrologic area (ha), and the Lower American hydrologic sub-area (hsa) and super planning watershed (spws) (California Department of Conservation, 2014). The American River is the nearest USGS blue-line stream in the vicinity, and the American River watershed consists of approximately 1,900 square miles from the Sierra Nevada to the City of Sacramento. The American River watershed drains the Sierra Nevada and surrounding foothills via the North Fork, Middle Fork, and South Fork of the American River, which drain to Folsom Lake. Folsom Dam, located approximately 12.5 miles upstream of the project site, dams the American River and creates Folsom Lake, a Central Valley Project reservoir that provides drinking water, flood control, hydroelectric power, and irrigation water. The American River then discharges from Folsom Lake to Lake Natoma, a regulating reservoir for Folsom Dam that is created by the Nimbus Dam. **Figure 13** shows the American River and other tributaries in the vicinity of the project site, including the unnamed drainage that collects stormwater runoff and discharge from the Aerojet GET LB facility.



SOURCE: Sacramento County,11/2005; UC-G Aerial Photograph, 2/2012; AES, 2014

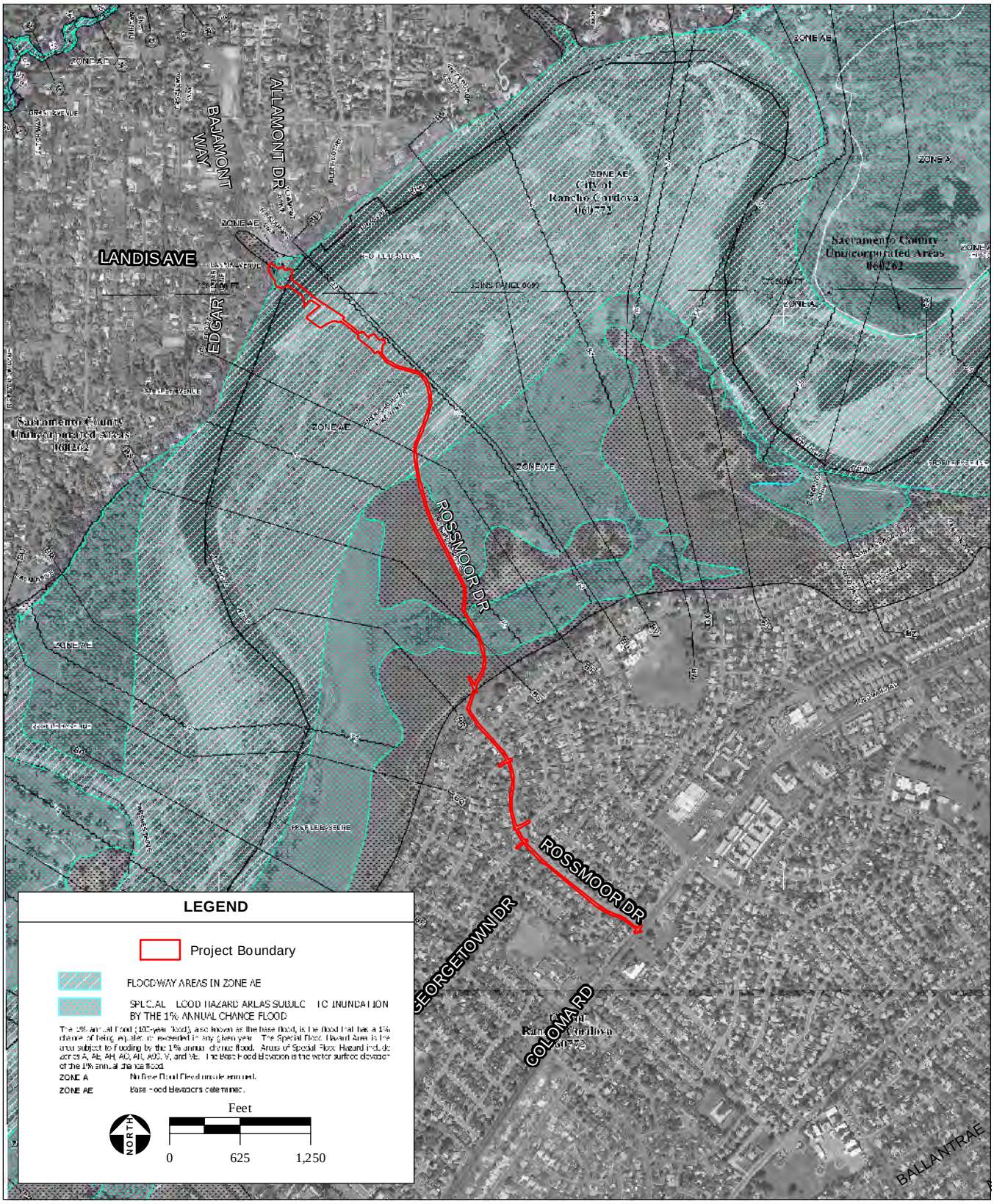
Figure 13
Surface Water Resources

The 27-mile stretch of the lower American River (from Nimbus Dam to the confluence with the Sacramento River) is listed on the 303(d) list of impaired waterbodies for mercury, polychlorinated biphenyls (PCBs), and unknown toxicity (CalEPA, 2010). The TMDL for mercury was approved in 2010, and the TMDL for PCBs and unknown toxicity are expected to be completed in 2021 (CalEPA, 2010).

The Federal Emergency Management Agency (FEMA) oversees the delineation of flood zones and the provision of federal disaster assistance. FEMA manages the National Flood Insurance Program and publishes the Flood Insurance Rate Maps (FIRMs), which show the expected frequency and severity of flooding by area, typically for the existing land use and type of drainage/flood control facilities present. The project site is located on FIRM 06067C0093H and 06067C0206H. As shown in **Figure 14**, many portions of the project site are located within FEMA 100-year flood zones (Zone A) because they are located adjacent to the American River and within the American River Parkway. Portions of the pipeline alignment along Rossmoor Drive are outside of the 100-year floodplain (FEMA, 2012).

Groundwater

The project site lies over the southeast portion of the Sacramento Valley Groundwater Basin, a complex system of groundwater aquifers generally composed of marine sediments and stratified sand, silt, and clay layers many thousands of feet thick; only the upper layers contain usable water (DWR, 2004). The portion of the Sacramento Valley basin that lies beneath the project site is known as the South American Subbasin, ID 5-21.65 (DWR, 2004). This groundwater subbasin is approximately 388 square miles, composed of alluvial deposits (flood basin, dredge tailings, and Holocene stream channel deposits) and Miocene/Pliocene volcanic. In the eastern Sierra Nevada foothills, the aquifer is shallow on the order of a few hundred feet deep, but it increases in thickness approaching the western boundary, reaching over 2,500 feet deep on the western margin of the subbasin. Department of Water Resources (DWR) estimated the storage capacity of the subbasin at 4,816,000 acre-feet (DWR, 2004). Groundwater in the South American Subbasin is typically calcium magnesium bicarbonate or magnesium calcium bicarbonate. Significant groundwater contamination has occurred within the subbasin as a result of three EPA-designated Superfund sites, Aerojet, Mather Field, and the Sacramento Army Depot, as well as other sources of contamination from landfills, power plants, and railyards in the region (DWR, 2004). The Proposed Project is part of an ongoing effort by Aerojet to remediate contamination in the groundwater basin.



SOURCE: FEMA FIRMS Effective 8/16/2012 ; AES, 2014

Figure 14
FEMA Flood Zones

3.10.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

HYDROLOGY & WATER QUALITY	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) 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) 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) 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 manner that would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☒	☐	☐
g) 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) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☒	☐

HYDROLOGY & WATER QUALITY	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
i) 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) Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

Questions A, C and F – Water Quality

Construction of the Proposed Project may violate water quality standards or waste discharge requirements, as construction equipment and materials have the potential to leak, thereby discharging pollutants into both surface water and groundwater. Construction site pollutants include particulate matter, sediment, oils and greases, concrete, and adhesives. Discharge of these pollutants could result in contamination of the unnamed drainage and the American River, causing an exceedance of water quality objectives. Because grading, trenching, and earth moving activities associated with the components of the Proposed Project have the potential to result in erosion, siltation, and contamination of surface water and groundwater, this is considered a potentially significant impact. Water quality decreases with increased turbidity and total suspended solids (TSS), which may result from erosion and siltation of improperly stockpiled soil or open excavations, or the removal of the abandoned structures within the bed and banks of the American River.

In compliance with the CWA, the District would obtain coverage under the NPDES General Construction Permit (No. 2009-0009-DWQ) for construction activities and implement the listed BMPs during construction to prevent impacts to water quality (see **Mitigation Measure GS-2**). The General Construction Permit also includes post-construction performance standards requiring all construction sites match pre-project hydrology to ensure that the physical and biological integrity of aquatic ecosystems are sustained. Additionally, the Proposed Project is subject to Chapter 16.44 of the Sacramento County Municipal Code: Land Grading and Erosion Control Ordinance and Section 11 of the Sacramento County Improvement Standards; therefore, Erosion and Sediment Control Plans will be submitted to the Sacramento County Public Works for review and approval.

Because portions of the pipeline will be installed within the American River floodplain, it is possible that groundwater or riparian underflow will be encountered during pipeline trenching, however the deepest pipeline installation under the river will be accomplished using a horizontal directional drilling technique. Horizontal directional drilling is generally considered to have a smaller impact area than traditional drilling methods, although there is risk of frac-out (inadvertent returns of hazardous chemicals) that present a significant impact to water quality. **Mitigation Measure BR-3** requires an agency-approved frac-out contingency plan be created to minimize this potentially significant impact.

In addition, the culvert replacement, removal of the abandoned vaults and bank stabilization on the north bank, and pipeline removal from across the American River will result in the use of construction equipment within or in close proximity to the American River. During construction, unauthorized or accidental release of any fuel, hydraulic fluids, lubricants, solvents, or other chemical into the excavation cavity could directly enter surface waters and the groundwater aquifer. Implementation of the BMPs required in **Mitigation Measure GS-2** will minimize the potential for contamination of surface water and groundwater during construction. Additionally, **Mitigation Measures BR-3 through BR-6** ensure BMPs, cofferdams, moveable silt or sediment curtains, and other measures to prevent sedimentation are utilized in each phase of construction. In addition, **Mitigation Measure BR-4** requires bank stabilization measures be implemented on the river bank following project construction.

In addition to the NPDES General Construction Permit, the Proposed Project will be required to comply with a CWA Section 404 Permit issued by the USACE and a Section 401 Water Quality Certification issued by the Central Valley RWQCB. With implementation of **Mitigation Measure GS-2** and the measures provided in **Section 3.5.3**, the Proposed Project will comply with the California General NPDES Permit for construction activities and any impacts to water quality will be reduced to less-than-significant levels. **Less than Significant with Mitigation.**

Question B – Groundwater Supplies

The Proposed Project involves the conveyance of groundwater. As discussed in **Section 2.3**, Aerojet currently pumps groundwater at an existing well field upstream from the project site, treats it at an existing water treatment plant, and discharges it into the American River at Buffalo Creek (shown on **Figure 13**). The American River conveys the treated water downstream, where CWD collects the water and, following implementation of the Proposed Project, will transport it to GSWC to replace water within the Rancho Cordova area that has been lost to contamination. The Proposed Project will enable implementation of an ongoing groundwater remediation program and will allow GSWC to serve customers within its service area clean, treated drinking water from CWD's Bajamont WTP. The Proposed Project will not introduce impermeable surfaces that will decrease groundwater infiltration, and it will not substantially deplete groundwater supplies. **Less than Significant.**

Questions D and E – Drainage and Flooding

The Proposed Project would include work within the bed and banks of the mainstem American River and an unnamed drainage channel tributary to the American River. Specific project components that may alter the drainage pattern of the site include culvert replacement and abandoned vault removal. The pipeline construction under the American River and within Rossmoor Drive will be trenched underground and any impacted land will be returned to pre-project topographic contours, and will therefore not have a significant impact on the drainage pattern of the site or area.

The upgrade of the existing culvert in the unnamed drainage to a larger bottomless culvert will increase the ability of the unnamed drainage to convey storm flows, and will have a beneficial impact on the drainage capacity of the stream. The removal of the abandoned Ranney collector pipeline across the American River will restore the river bottom to a more natural condition, and will therefore have a beneficial impact to the river. The removal of the abandoned concrete vaults in the north bank of the American River may alter the banks of the river; however, the goal of this portion of the Proposed Project

is to return the river banks to a more natural slope and condition, which will not impede drainage or flood flows.

No components of the Proposed Project would contribute excess runoff water that would exceed the capacity of existing or planned stormwater drainage systems, or would provide substantial additional sources of polluted runoff. **Less than Significant.**

Questions G, H, I, and J – Flood Hazards and Catastrophic Events

Many of the project components would be conducted within an area designated as Zone A (100-year flood zone); however, project components do not include housing or residential structures. No new above-ground structures would be introduced that could impact flood flows. The upgrade of the culvert would be designed to better convey storm and flood flows through the unnamed drainage. No new structures would be introduced that could impact flood flows. The Proposed Project does not involve building any levees, building pipelines through any levees, or building dams, and would not expose people or structures to a significant risk of loss, injury, or death involving flooding due to dam or levee failure. The project site and vicinity are not at risk for inundation by seiche, tsunami, or mudflow. **Less than Significant**.

Cumulative Impacts

Construction of cumulative projects in the vicinity of the Proposed Project would be required to comply with the National Pollutant Discharge Elimination System, which is intended to reduce the potential for cumulative impacts to water quality during construction. Therefore, impacts associated with cumulative construction related water quality effects would be less than significant.

Projects in the region that involve modifications to the stormwater system are required to comply with NPDES Permit No. CAS082597 for Municipal Separate Storm Sewer Systems, which is designed to reduce cumulative impacts to the local watershed to less-than-significant levels. Similar to the Proposed Project, cumulative development projects would be subject to local, State, and federal regulations designed to minimize cumulative impacts to water resources. Standard measures for the Proposed Project in combination with compliance with County, State, and federal regulations would reduce cumulatively considerable impacts to water quality to a less than significant level. Therefore, the Proposed Project's incremental contribution to cumulative effects to water resources is less than significant. **Less than Significant.**

3.10.3 MITIGATION MEASURES

None required.

3.11 LAND USE & PLANNING

3.11.1 SETTING

The project site extends through multiple land uses as designated by the County of Sacramento and City of Rancho Cordova. On the north bank of the American River where the culvert replacement and other stream restoration components are proposed, the area is designated as Natural Preserve by the County

(Sacramento County, 2011). The pipeline alignment crosses beneath the American River through the American River Parkway, which is designated by the County as Recreation (Sacramento County, 2011). The remainder of the pipeline alignment along Rossmoor Drive is designated as Low Density Residential by the City of Rancho Cordova. Land uses in the surrounding vicinity include residential to the north and south of the project site, and open space and recreation along the American River Parkway.

3.11.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

LAND USE & PLANNING	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) 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) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Questions A – C

The Proposed Project will not physically divide an established community or conflict with any applicable land use plan or policy. There are no habitat conservation plans (HCPs) or natural community conservation plans that are applicable to the project site, although the nearest HCP is the draft South Sacramento HCP located approximately 1.1 miles south of the project site. Although outside of the boundaries of the South Sacramento HCP, the Proposed Project and its stream restoration components would not conflict with the goals therein (Sacramento County, 2014). **No Impact.**

Cumulative Impacts

The project components are consistent with the County General Plan land use designations; therefore no cumulative impacts would occur. **No Impact.**

3.11.3 MITIGATION MEASURES

None required.

3.12 MINERAL RESOURCES

3.12.1 SETTING

Mineral resources in Sacramento County include natural gas, petroleum, sand, gravel, clay, gold, silver, peat, topsoil, and lignite, of which aggregate (sand and gravel) and petroleum are the primary resources in production today (Sacramento County, 2011). The primary remaining aggregate deposits in the County are located in the Old American River channel south of Rancho Cordova and located outside of the project site (Sacramento County, 2011).

The project area has historically been mined for gold and aggregate (sand and gravel). An aggregate production facility is located approximately 0.5 miles upstream of the project site; however, it has not been active for more than 15 years (Division of Mines and Geology, 1999). There are no active mines or quarries on the project site.

3.12.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

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

Questions A and B

There is no active mining in the project area, and no prospects for future mining. Therefore, no impact to mineral resources important to the region or the state would occur. **No Impact.**

Cumulative Impacts

There are no current or proposed future mining operations in the area. No cumulative impacts would occur. **No Impact.**

3.12.3 MITIGATION MEASURES

None required.

3.13 NOISE

3.13.1 SETTING

Noise Descriptors

The ambient noise level is defined as the existing range of noise levels from all sources near and far. A similar term is background noise level, which usually refers to the ambient noise level that is present when any intermittent noise sources are absent. Community Noise Equivalent Level (CNEL) or Day-Night Average Sound Level (Ldn) contours are frequently utilized to graphically portray community noise exposure. The CNEL is calculated from hourly Noise Equivalence Level (Leq) values, after adding a "penalty" to the noise levels measured during the evening (7 p.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods. The penalty for evening hours is a factor of 3, which is equivalent to 4.77 decibels (dB). The penalty for nighttime hours is a factor of 10, which is equivalent to 10 dB. To calculate the DNL, day-night average sound level (Ldn), the evening penalty is omitted. The Leq is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value.

Sensitive Noise Receptors

Some land uses are more sensitive to noise than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than commercial and industrial land uses. A sensitive receptor is defined as any living entity or aggregate of entities whose comfort, health, or well being could be impaired or endangered by the existence of noise.

The land surrounding the project alignment is primarily residential with some recreational uses and open space. On the north bank of the American River where the culvert is proposed to be replaced and various other stream restoration components would be completed, the nearest sensitive receptors are existing residences located within 100 feet of proposed construction activities ~~is a residence directly adjacent to the project site~~. On the south bank, the HDD pipeline would emerge and tie into the conventionally trenched pipeline within the American River Parkway; this recreation area is not a sensitive noise land use. The remaining pipeline alignment will follow Rossmoor Drive, where the nearest noise sensitive receptors are adjacent homes.

Sacramento County

The portion of the project site on the north bank of the American River lies within the boundaries of Sacramento County. The relevant General Plan goals and policies, as well as ordinances, are discussed below.

General Plan

The following are applicable General Plan noise Goals and Policies from the Sacramento County General Plan:

NO-1 The noise level standards for noise-sensitive areas of new uses affected by traffic or railroad noise sources in Sacramento County are shown by Table 1 (please refer to the General Plan for this table). Where the noise level standards of Table 1 are predicted to

be exceeded at new uses proposed within Sacramento County which are affected by traffic or railroad noise, appropriate noise mitigation measures shall be included in the project design to reduce projected noise levels to a state of compliance with the Table 1 standards.

NO-6 Where a project would consist of or include non-transportation noise sources, the noise generation of those sources shall be mitigated so as not exceed the interior and exterior noise level standards of Table 2 at existing noise-sensitive areas in the project vicinity.

NO-8 Noise associated with construction activities shall adhere to the County Code requirements. Specifically, Section 6.68.090(e) addresses construction noise within the County.

NO-13 Where noise mitigation measures are required to satisfy the noise level standards of this Noise Element, emphasis shall be placed on the use of setbacks and site design to the extent feasible, prior to consideration of the use of noise barriers.

Sacramento County Codes and Ordinances

Sacramento County Code Section 6.68 addresses noise standards in the County, and subsection 6.68.070 provides the following guidance for exterior noise levels:

TABLE 3-10
SACRAMENTO COUNTY EXTERIOR NOISE STANDARDS

County Zoning Districts	Time Period	Exterior Noise Standard
RE-1, RD-1, RE-2, RD-2, RE-3, RD-3, RD-4, R-1-A, RD-5, R-2, RD-10, R-2A, RD-20, R-3, R-D-30, RD-40, RM-1, RM-2, A-1-B, AR-1, A-2, AR-2, A-5, AR-5	7 a.m. – 10 p.m.	55 dBA
	10 p.m. – 7 a.m.	50 dBA
Source: Sacramento County Code Section 6.68.070(a)		

Section 6.68.090(e) states that the following activities shall be exempted from other noise requirements listed in Section 6.68.090:

> Noise sources associated with construction, repair, remodeling, demolition, paving or grading of any real property, provided said activities do not take place between the hours of eight p.m. and six a.m. on weekdays and Friday commencing at eight p.m. through and including seven a.m. on Saturday; Saturdays commencing at eight p.m. through and including seven a.m. on the next following Sunday and on each Sunday after the hour of eight p.m. Provided, however, when an unforeseen or unavoidable condition occurs during a construction project and the nature of the project necessitates that work in process be continued until a specific phase is completed, the contractor or owner shall be allowed to continue work after eight p.m. and to operate machinery and equipment necessary until completion of the specific work in progress can be brought to conclusion under conditions which will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner.

City of Rancho Cordova

The portion of the project site on the south bank of the American River and along Rossmoor Drive lies within the boundaries of the City of Rancho Cordova. The relevant General Plan goals and policies, as well as ordinances, are discussed below.

General Plan

Policy N.1.1 Establish standards and policies consistent with those in Tables N-1 (refer to **Table 3-11** below) and N-2 (please refer to the General Plan for this table) to govern maximum sound levels in new development.

TABLE 3-11
RANCHO CORDOVA NOISE LEVEL PERFORMANCE STANDARDS

Stationary Noise Source	Noise Level Descriptor	Daytime Maximum (7 a.m. to 10 p.m.)	Nighttime Maximum (10 p.m. to 7 a.m.)
Typical	Hourly Leq, dB	55	45
Tonal, impulsive, repetitive, or consist primarily of speech or music	Hourly Leq, dB	50	40
Source: City of Rancho Cordova, 2006			

Policy N.1.4 Mitigate noise created by proposed non-transportation noise sources to comply with the City's noise standards to the maximum extent feasible.

Action N.1.4.1 Limit construction activity to the hours of 7:00 a.m. to 7:00 p.m. weekdays and 8:00 a.m. to 6:00 p.m. weekends when construction is conducted in proximity to residential uses.

Action N.1.4.3 Require stationary construction equipment and construction staging areas to be set back from existing noise-sensitive land uses.

Policy N.1.7 To the extent feasible and appropriate, the City shall require the use of temporary construction noise control measures for public and private project that may include the use of temporary noise barriers, temporary relocation of noise-sensitive land uses or other appropriate measures.

City of Rancho Cordova Codes and Ordinances

Rancho Cordova Code Section 6.68 addresses noise standards in the City, consistent with the County ordinances, and subsection 6.68.070 provides the following guidance for exterior noise levels:

TABLE 3-12
RANCHO CORDOVA EXTERIOR NOISE STANDARDS

City Zoning Districts	Time Period	Exterior Noise Standard
RE-1, RD-1, RE-2, RD-2, RE-3, RD-3, RD-4, R-1-A, RD-5, R-2, RD-10, R-2A, RD-20, R-3, RD-30, RD-40, RM-1, RM-2, A-1-B, AR-1, A-2, AR-2, A-5, AR-5	7 a.m. – 10 p.m.	55 dBA
	10 p.m. – 7 a.m.	50 dBA
Source: Rancho Cordova Code Section 6.68.070(a)		

Section 6.68.090(E) states that the following activities shall be exempted from other noise requirements listed in Section 6.68.090:

> Noise sources associated with construction, repair, remodeling, demolition, paving or grading of any real property, provided said activities do not take place between the hours of 8:00 p.m. and 6:00 a.m. on weekdays and Friday commencing at 8:00 p.m. through and including 7:00 a.m. on Saturday; Saturdays commencing at 8:00 p.m. through and including 7:00 a.m. on the next following Sunday and on each Sunday after the hour of 8:00 p.m.; provided, however, when an unforeseen or unavoidable condition occurs during a construction project and the nature of the project necessitates that work in process be continued until a specific phase is completed, the contractor or owner shall be allowed to continue work after 8:00 p.m. and to operate machinery and equipment necessary until completion of the specific work in progress can be brought to conclusion under conditions which will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner.

3.13.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

NOISE	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a) 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) Exposure of persons to or generation of excessive groundborne vibration noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
d) 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?	☐	☐	☐	☒

Questions A, C, and D

Construction

Construction of the Proposed Project would generate noise and may temporarily increase noise levels at nearby sensitive land uses. Noise impacts resulting from construction would depend on: 1) the noise generated by various pieces of construction equipment; 2) the timing and duration of noise generating activities; 3) the distance between construction noise sources and noise sensitive receptors; and 4) existing ambient noise levels.

Table 3-13 shows the approximate noise level of common construction equipment that may be used during construction of the Proposed Project at 50 feet. The general plans of both the City and County specify 55 dBA as the maximum noise level for residential outdoor activity areas during the daytime hours of 7 a.m. to 10 p.m., so 55 dBA was selected as the noise threshold to provide a conservative analysis. As shown in **Table 3-13**, construction equipment may exceed the 55 dBA threshold at 50 feet. Therefore, this is a significant impact.

TABLE 3-13
APPROXIMATE NOISE LEVEL OF COMMON CONSTRUCTION EQUIPMENT

Equipment	dBA Leq at 50 feet
Pavement saw	90
Jack hammer	85
Excavator	85
Front-end loader	80
Dump truck	84
Crane	85
Bulldozer	85
Water truck	85
Trench shields	0
Air compressor	80
Flat-bed delivery truck	84
Concrete truck	85
Sweepers	80
Welding trucks	73
Backhoes	80
Source: Caltrans, 2009	

Implementation of **Mitigation Measure N-1** through **N-3** would reduce noise impacts and ensure construction of the Proposed Project adheres to both County and City noise ordinances. The potential for impacts associated with construction noise is less than significant with mitigation. **Less than Significant with Mitigation.**

Operation

Operation of the project, including the proposed pipeline and replacement culvert, will not emit noise. Periodic maintenance of the various project components may result in temporary sources of noise, which

would be reduced to less-than-significant levels through implementation of **Mitigation Measure N-1** through **N-3**. **Less than Significant with Mitigation.**

Question B

Generally, excessive vibration is only an issue when construction requiring the use of equipment with high vibration levels (i.e., compactors, large dozers, etc.) occurs within 25 to 100 feet of an existing structure. The Proposed Project will not require the use of equipment with high vibration levels. Given the infrequent use of heavy equipment, exposure to groundborne vibration from construction activities would not occur. Operation of the Proposed Project would not create groundborne vibration. The Proposed Project would not expose persons to excessive groundborne vibration noise levels; therefore, this is a less-than-significant impact. **Less than Significant.**

Questions E and F

The nearest airport is the Mather Airport approximately 3.75 miles south of the project site. The McClellan Airfield is located approximately 5.25 miles northwest of the project site. The Proposed Project is not located within an airport land use plan or in the vicinity of a private airstrip. **No Impact.**

Cumulative Impacts

As stated above, operation of the Proposed Project would require maintenance activities; however, these activities would be periodic and would not expose sensitive receptors to noise levels above the existing ambient noise level, cause substantial temporary or periodic increases in noise levels, nor permanently increase the ambient noise. Therefore the project would not result in cumulatively considerable impacts. This impact is considered less than significant. **Less than Significant.**

3.13.3 MITIGATION MEASURES

N-1 On the north bank of the American River (in Sacramento County), construction shall only occur between the hours of 6 a.m. and 8 p.m. Monday through Friday, and 7 a.m. to 8 p.m. on Saturday and Sunday. On the south bank portion of the project site (in the City of Ranch Cordova), construction activities shall be limited to the hours of 7:00 a.m. to 7:00 p.m. weekdays and 8:00 a.m. to 6:00 p.m. weekends.

N-2 Construction contractors shall use power construction equipment with state-of-the-art noise muffling devices. All internal combustion engines used on the project site shall be equipped with adequate mufflers and shall be in good mechanical condition to minimize noise created by faulty or poor maintained engines or other components.

N-3 Construction contractors shall locate stationary noise generating equipment as far as possible from sensitive receptors. Staging areas shall be located a minimum of 200 feet from noise sensitive receptors, such as residential uses.

3.14 POPULATION AND HOUSING

3.14.1 SETTING

Carmichael, an unincorporated community in Sacramento County, had an estimated population of approximately 31,762 in 2010; the City of Rancho Cordova, also located in Sacramento County, has a population of approximately 64,776 in 2010 (U.S. Census Bureau, 2010). The project components are primarily located within residential, recreation, and open space areas.

3.14.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

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

Question A

The Proposed Project would introduce new water infrastructure that would provide treated drinking water to Golden State Water Company (GSWC) for distribution within its service boundaries. However, the Proposed Project does not introduce new water into the system; rather, it will replace groundwater that has been contaminated. Therefore, the Proposed Project would not induce growth in the surrounding community because it does not increase the capacity of the existing distribution system. **No Impact.**

Questions B and C

Implementation of the Proposed Project would not displace existing housing or people. It would not result in the construction of new housing elsewhere. **No Impact.**

Cumulative Impacts

Cumulative growth in the region has been addressed in the general plans for the project vicinity (Sacramento County, 2011 and Rancho Cordova, 2006). The Proposed Project would not increase or facilitate growth beyond what is projected and accounted for in the General Plan. **No Impact.**

3.14.3 MITIGATION MEASURES

None required.

3.15 PUBLIC SERVICES

3.15.1 SETTING

Fire Protection/Emergency Medical Service

Fire protection and emergency medical services are provided to the project site and vicinity by the Sacramento Metropolitan Fire District, which serves a 417 square-mile service area that includes the City of Rancho Cordova and the community of Carmichael. Nearby fire stations include Fire Station 109 (1.75 miles west of the project site) and Fire Station 61 (1.6 miles south of the project site).

Law Enforcement

Law enforcement in Carmichael is provided by the Sacramento County Sherriff's Department, and law enforcement in Rancho Cordova is provided by the Rancho Cordova Police Department. The nearest sheriff's service station is located approximately 2.75 miles north of the project site, and the nearest police station is approximately 2.6 miles southwest of the project site.

Schools

The San Juan Unified School District provides public education to the community of Carmichael. The Folsom Cordova Unified School District provides education to the City of Rancho Cordova. There are two schools, Williamson Elementary School and W.E. Mitchell Middle School, located within one mile of the project site.

3.15.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

PUBLIC SERVICES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 time or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	☐	☒
b) Police Protection?	☐	☐	☐	☒
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒

Questions A – E

Construction and operation of the Proposed Project would not cause significant impacts to public services, including fire protection, police protection, emergency services, schools, parks, and public facilities in the community of Carmichael of the City of Rancho Cordova. **No Impact.**

Cumulative Impacts

The Proposed Project would not contribute to cumulative impacts to public services in the project area. **No Impact.**

3.15.3 MITIGATION MEASURES

None required.

3.16 RECREATION

3.16.1 SETTING

Sacramento County Regional Parks is responsible for management of County parks in the area of Carmichael. The project site runs through the American River Parkway – Rossmoor Bar Area. Cordova Recreation and Park District manages the parks and facilities in the City of Rancho Cordova, and the

nearest City-managed park is the Federspiel Park located 0.6 miles south of the project site. The American River Parkway is an important recreational amenity for the community, offering boating, biking, swimming, and camping opportunities.

3.16.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

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

Questions A and B

The Proposed Project would not result in population growth that would increase the use of regional parks and other recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. Many of the restoration components of the Proposed Project, including the culvert replacement, abandoned infrastructure removal, and vegetation plantings, would improve the quality of the American River and American River Parkway. A beneficial impact would occur. **No Impact.**

Cumulative Impacts

The Proposed Project would have a positive impact on regional recreation facilities. No cumulative impacts would occur. **No Impact.**

3.16.3 MITIGATION MEASURES

None required.

3.17 TRANSPORTATION

3.17.1 SETTING

Regulatory Context

Sacramento County General Plan

CI-9 Plan and design the roadway system in a manner that meets Level of Service (LOS) D on rural roadways and LOS E on urban roadways, unless it is infeasible to implement project alternatives or mitigation measures that would achieve LOS D on rural roadways or LOS E on urban roadways. The urban areas are those areas within the Urban Service Boundary as shown in the Land Use Element of the Sacramento County General Plan. The areas outside the Urban Service Boundary are considered rural.

CI-10 Land development projects shall be responsible to mitigate the project's adverse impacts to local and regional roadways.

Rancho Cordova General Plan

Policy C.1.2 Seek to maintain operations on all roadways and intersections at Level of Service D or better at all times, including peak travel times, unless maintaining this Level of Service would, in the City's judgment, be infeasible and/or conflict with the achievement of other goals. Congestion in excess of Level of Service D may be accepted in these cases, provided that provisions are made to improve traffic flow and/or promote non-vehicular transportation as part of a development project or a City-initiated project. Please see Policy C.1.3 for additional policy guidance related to this issue.

Action C.2.8.5 Provide signage, alternative routes, etc. during construction activities affecting bikeways to ensure the safety of cyclists.

Transportation Network Setting

Bajamont Way is a two lane paved undivided north/south oriented residential street that provides access to the Bajamont WTP and the residential uses surrounding it.

Rossmoor Drive is a two lane paved undivided north-south oriented roadway. Rossmoor Drive provides access to residential land use north of its initiation point at Coloma Road. It dead ends at the American River Parkway.

Coloma Road is a four lane paved divided east/west arterial in the City of Rancho Cordova. It runs from Folsom Boulevard in the southwest to Gold Country Boulevard in the northeast.

American River Bike Trail is a paved two lane bike trail that begins in Discovery Park in the City of Sacramento and runs along the American River for approximately 32 miles until it ends at Folsom Lake.

3.17.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

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

Questions A and B

Construction

The Proposed Project would temporarily increase traffic during the construction period. Limited construction traffic would travel through the community of Carmichael to access the northern section of the project site. Equipment delivery and construction worker commuting would be short-term and would not occur during peak traffic hours; therefore, construction would have a less-than-significant impact to the Carmichael roadways.

On the south bank of the American River where the HDD pipeline emerges within the American River Parkway, no road closures are anticipated. However, the pipeline segment that will be installed within Rossmoor Drive may result in lane closures during installation. This is a potentially significant impact. However, with implementation of **Mitigation Measure T-1**, impacts would be reduced to a less-than-significant level. **Less than Significant with Mitigation.**

Operation

The Proposed Project is not considered a trip generating project. Maintenance of the proposed pipeline and culvert would not increase traffic on local roadways above existing levels. A less-than-significant impact would occur. **Less than Significant.**

Question C

The nearest airport is the Mather Airport approximately 3.75 miles south of the project site. The McClellan Airfield is located approximately 5.25 miles northwest of the project site. The Proposed Project would not alter air traffic patterns, or increase traffic levels or a change in location that results in substantial safety risks. Therefore, no impact would occur. **No Impact.**

Question D

The Proposed Project would not change the design or uses of existing roads, and would not introduce any hazards. Therefore, no impact would occur. **No Impact.**

Question E

Construction

During construction, it is anticipated that no lane closures on local roadways would occur within the community of Carmichael; therefore, construction activities would not impede emergency vehicles on the north side of the American River. Lane closures may be necessary on Rossmoor Drive in the City of Rancho Cordova during the proposed pipeline installation. This could impede emergency vehicle access. However, with implementation of **Mitigation Measure T-1**, impacts would be reduced to less-than-significant levels. **Less than Significant with Mitigation.**

Operation

During operation of the Proposed Project, lane closures would not be necessary to maintain the culvert or other stream restoration components. Similar to the construction period, lane closures may be necessary along Rossmoor Drive for repairs. The District would obtain an Encroachment Permit from the City should any road or lane closures be necessary. Therefore, this impact is less than significant. **Less than Significant.**

Question F

Construction of the Proposed Project on the north bank of the American River would not affect any public transit, bicycle, or pedestrian facilities. However, construction on the south bank within the American River Parkway may affect the American River Bike Trail. This would be a significant impact.

Implementation of **Mitigation Measure T-2** would ensure that appropriate signage and routes are available to cyclists, consistent with Rancho Cordova General Plan Action Item C.2.8.5. **Less than Significant with Mitigation.**

Cumulative Impacts

Traffic impacts from the Proposed Project would be limited to short-term construction effects near the project site. No concurrent construction activities near the roadway network are anticipated, and therefore no cumulative traffic impacts would occur. **No Impact.**

3.17.3 MITIGATION MEASURES

T-1 The District shall obtain an Encroachment Permit from the City of Rancho Cordova Public Works Department prior to project construction that will result in lane closures of any public roads. The Applicant shall abide by the terms of the permit, including the requirements for preparation of a traffic control plan.

T-2 If construction equipment or construction activities will impede access on the American River Bike Trail, result in temporary closures, or otherwise affect the safety of cyclists and pedestrians in the area, the District shall provide signage and alternative routes, if appropriate, to ensure the safety of cyclists and pedestrians.

3.18 UTILITIES AND SERVICE SYSTEMS

3.18.1 SETTING

Water Suppliers and Supply

CWD supplies potable water in the community of Carmichael, while the City of Rancho Cordova is supplied by GSWC. The Proposed Project will ensure the continued reliability and quality of water that GSWC provides to its customers, and will replace groundwater that has been affected by contamination.

Solid Waste Collection and Disposal

Sacramento County Waste Management & Recycling provides solid waste collection and disposal in the unincorporated areas of Sacramento County. Republic Services, Inc. provides solid waste and recycling services in the City of Rancho Cordova. The nearest landfills are the North Area Recovery Station, approximately 5.0 miles northwest of the project site, and the Kiefer Landfill, located approximately 9.8 miles southeast of the project site.

Power and Natural Gas

Sacramento Municipal Utility District (SMUD) provides electricity to the area. Natural gas is provided by Pacific Gas & Electric (PG&E).

Communications

Internet and phone service in the community of Carmichael and City of Rancho Cordova is provided by numerous companies, including AT&T, Verizon, Cox, and Comcast.

3.18.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

UTILITIES & SERVICE SYSTEMS	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) 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) 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?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e) 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) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste.	☐	☐	☒	☐

Questions A – C

The Proposed Project would not result in the generation of additional wastewater. Therefore, the Proposed Project would not result in the exceedance of wastewater treatment requirements or require the construction of new wastewater treatment facilities. The Proposed Project would utilize existing CWD infrastructure to provide treated water to GSWC, avoiding the construction of additional water treatment facilities. In addition, the Proposed Project pipeline route along Rossmoor Drive would be located almost entirely within paved, disturbed, or previously developed areas, and will not change stormwater drainage

requirements. The culvert replacement on the north bank of the American River would replace the existing undersized culvert with an adequately sized culvert to convey stormwater flows. Therefore, it would not require the construction of new stormwater drainage facilities, and would improve existing drainage facilities. **No Impact.**

Question D

The Proposed Project may require small amounts of water during construction, but it will not result in a permanent increase in the water demand placed upon the existing water treatment plant. The Proposed Project involves the treatment and conveyance of water to GSWC via CWD infrastructure. The Aerojet groundwater remediation program is ongoing, and the Proposed Project would not change the amount of water utilized by Aerojet, CWD, or GSWC. No surface water would be diverted or utilized as part of the Proposed Project. **Less than Significant.**

Question E

The Proposed Project would not generate wastewater that would require processing at a wastewater treatment plant. **No Impact.**

Questions F and G

The removal of the old Ranney collector pipe, the concrete, rebar, metal tracks, and portions of the vaults will generate construction waste during the construction and restoration phases of the Proposed Project. All waste materials will be disposed of at either an approved recycling location or an approved waste management facility. An emphasis will be placed on recycling all appropriate materials to the degree feasible. Operation of the proposed pipeline would not result in the generation of solid waste. The Proposed Project will comply with all laws and regulations regarding solid waste generation and disposal. **Less than Significant.**

Cumulative Impacts

The Proposed Project would not contribute to cumulative impacts to utilities in the project area. The Proposed Project would ensure that the GSWC is able to continue providing potable water to its customers, but would not increase the amount of water demanded. **No Impact.**

3.18.3 MITIGATION MEASURES

None required.

3.19 MANDATORY FINDING OF SIGNIFICANCE

3.19.1 SETTING

The setting for each resource area has been described within the applicable “Setting” sections, above.

3.19.2 ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant With Mitigation	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 environment effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Question A – Environmental Effects

As discussed in the preceding sections, the Proposed Project has a potential to create shortterm impacts associated with construction which could degrade the quality of the environment; however, with implementation of the identified mitigation measures, all potential impacts would be reduced to less-than-significant levels. The long term effect of the Proposed Project would be to improve GSWC's ability to provide high-quality, treated drinking water to its customers within its existing service area. **Less than Significant with Mitigation.**

Questions B and C – Cumulative and Indirect Effects

Cumulative impacts and indirect effects for each resource area have been considered within the analysis of each resource area. When appropriate, mitigation measures have been provided to reduce all potential impacts to a less-than-significant level. **Less than Significant with Mitigation.**

3.19.3 MITIGATION MEASURES

None required.

SECTION 4.0

SIGNIFICANCE DETERMINATION

4.0 SIGNIFICANCE DETERMINATION

On the basis of the environmental evaluation presented in **Section 3.0**:

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

☒ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project design and project-specific mitigation measures described in **Section 3.0** have been agreed to by the project proponent. A NEGATIVE DECLARATION is recommended to be adopted.

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

Stan M. Nugat
Signature

3/23/2015
Date

Steven M. Nugent
Printed Name

Carmichael Water District
Lead Agency

SECTION 5.0

LIST OF PREPARERS

5.0 LIST OF PREPARERS

CARMICHAEL WATER DISTRICT – LEAD AGENCY

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Lynette Moreno, Assistant Manager

ANALYTICAL ENVIRONMENTAL SERVICES – ENVIRONMENTAL CONSULTANT

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Project Manager:	Pete Bontadelli
Deputy Project Manager:	Annalee Sanborn – Environmental Analyst
Technical Staff:	Mark Hopkins– Botanist / Senior Biologist
	Marc Beccio – Biologist
	Katelyn Peterson – Biologist
	Charlane Gross – Archeologist
	Erin Quinn – Environmental Analyst
	Dana Hirschberg – Graphics
	Glenn Mayfield – Graphics

KENNEDY/JENKS CONSULTANTS – PROJECT ENGINEERS

Ryan S. Young, PE
Alexander R. Peterson, PE

SECTION 6.0

REFERENCES

6.0 REFERENCES

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APPENDICES

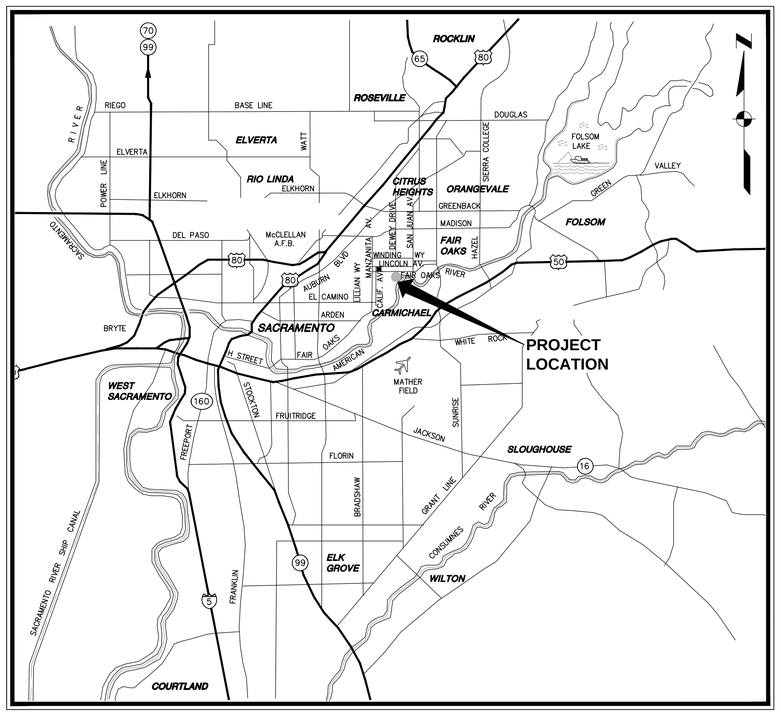
APPENDIX A

PRELIMINARY ENGINEERING REPORT

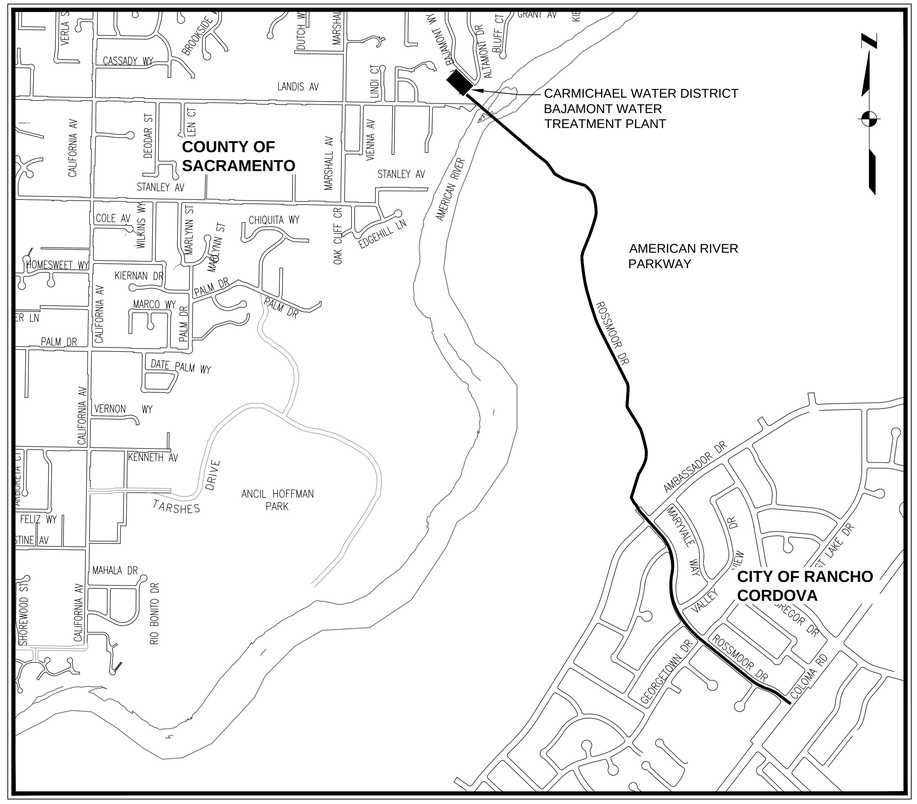
CONSTRUCTION PLANS FOR

CARMICHAEL WATER DISTRICT / GOLDEN STATE WATER COMPANY
AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

AUGUST 2014
90% SUBMITTAL



VICINITY MAP
SCALE: NTS



LOCATION MAP
SCALE: 1" = 1000' (APPROX)

UTILITY	REPRESENTATIVE	PHONE
GAS	PACIFIC GAS & ELECTRIC 5555 FLORIN-PERKINS ROAD SACRAMENTO, CA 95826	(916) 386-5153 OR U.S.A.
ELECTRICITY	SACRAMENTO MUNICIPAL UTILITY DISTRICT 1708 59TH STREET SACRAMENTO, CA 95817	(916) 349-3668 OR U.S.A.
TELEPHONE	SBC 3675 T STREET. ROOM 111 SACRAMENTO, CA 95816	(916) 453-7315 OR U.S.A.
WATER	CARMICHAEL WATER DISTRICT 7837 FAIR OAKS BLVD. CARMICHAEL, CA 95609	(916) 483-2452 OR U.S.A.
SEWER	CSD-1 10545 ARMSTRONG AVE, SUITE 101 MATHER, CA 95655	(916) 875-6730 OR U.S.A.

UTILITY	REPRESENTATIVE	PHONE
DRAINAGE	COUNTY OF SACRAMENTO 827 7TH STREET SACRAMENTO, CA 95814	(916) 874-6851 OR U.S.A.
CABLE TV	COMCAST CABLE 4350 PELL DRIVE SACRAMENTO, CA 95838	(916) 927-2225 OR U.S.A.
USA	UNDERGROUND SERVICE ALERT	(800) 642-2444 OR 811
FIRE DEPARTMENT	SACRAMENTO METRO FIRE DEPARTMENT 3112 GOLD CANAL DRIVE RANCHO CORDOVA, CA 95670	(916) 942-3300 OR 911 EMERGENCY

WATER AND FIRE APPROVAL BLOCK

APPROVED BY: _____
CITY OF RANCHO CORDOVA — DATE

APPROVED BY: _____
SACRAMENTO METRO FIRE DEPARTMENT — DATE

APPROVED BY: _____
STEVE NUGENT, GENERAL MANAGER CARMICHAEL WATER DISTRICT — DATE

SUBMITTED BY: _____
ALEX R. PETERSON, R.C.E. 46095 — DATE

PRELIMINARY N.F.C.

USE OF DOCUMENTS

THIS DOCUMENT, INCLUDING THE INCORPORATED DESIGNS, IS AN INSTRUMENT OF SERVICE FOR THIS PROJECT AND SHALL NOT BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF KENNEDY/JENKS CONSULTANTS.

NO.	REVISION	DATE	BY

SCALES
0 — 1"
0 — 25mm
IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY
DRAWN HCS
CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

TITLE SHEET, VICINITY AND LOCATION MAP

90% SUBMITTAL

FILE NAME 147000200G01
JOB NO. 1470002*00
DATE AUGUST 2014
SHEET G1 OF 21

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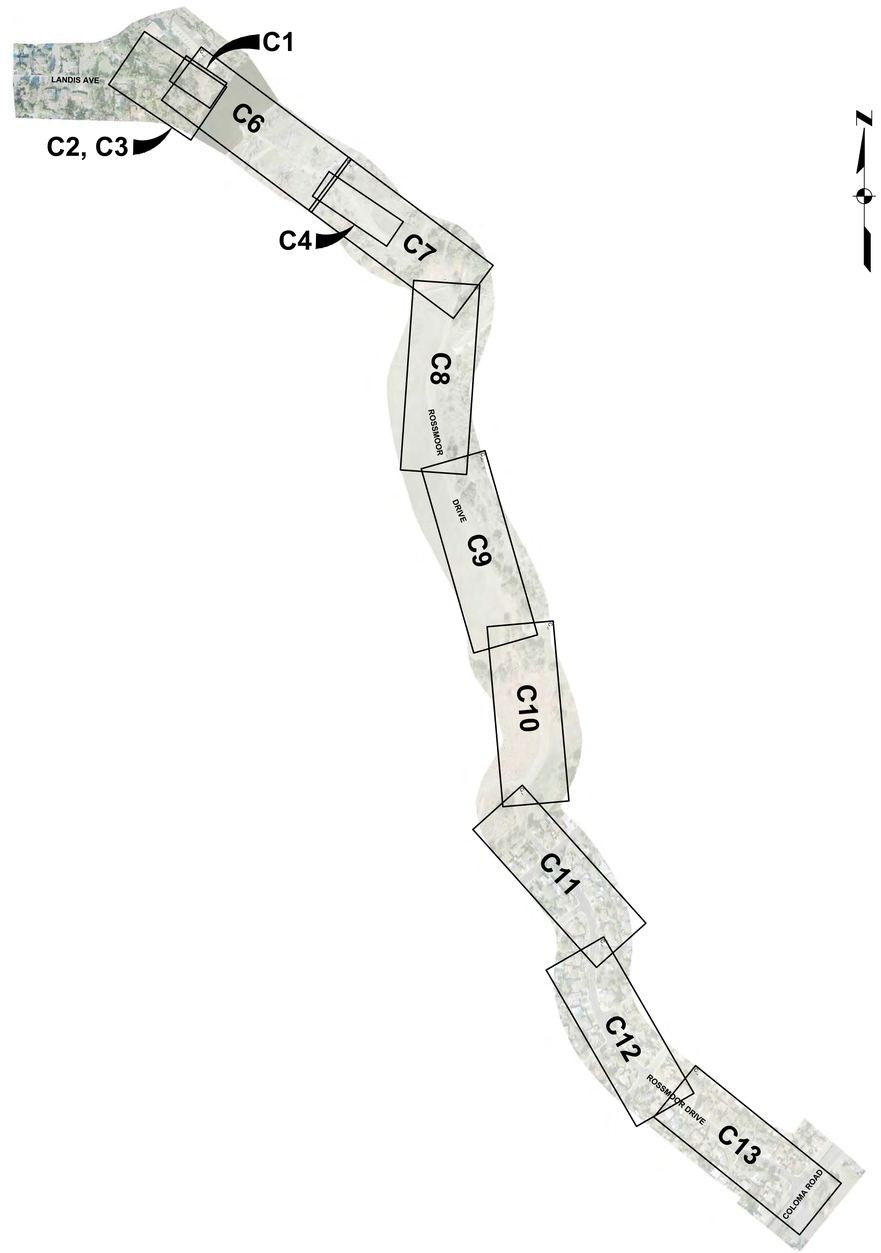
DRAWING INDEX

DRAWING NO	SHEET NO	DRAWING TITLE
GENERAL		
1	G1	TITLE SHEET, VICINITY AND LOCATION MAP
2	G2	DRAWING AND SHEET LAYOUT INDEX
3	G3	GENERAL NOTES, LEGEND, ABBREVIATIONS AND SURVEY NOTES
CIVIL		
4	C1	DEMOLITION PLAN
5	C2	SITE ACCESS AND GRADING - NORTH BANK
6	C3	ENVIRONMENTAL RESTORATION - NORTH BANK
7	C4	HDD GRADING PLAN SOUTH BANK
8	C5	HDD PROFILE
9	C6	PLAN AND PROFILE STA. 10+00 TO 19+00
10	C7	PLAN AND PROFILE STA. 19+00 TO 28+00
11	C8	PLAN AND PROFILE STA. 28+00 TO 37+50
12	C9	PLAN AND PROFILE STA. 37+50 TO 47+00
13	C10	PLAN AND PROFILE STA. 47+00 TO 56+50
14	C11	PLAN AND PROFILE STA. 56+50 TO 66+00
15	C12	PLAN AND PROFILE STA. 66+00 TO 75+50
16	C13	PLAN AND PROFILE STA. 75+50 TO 84+13.18
17	C14	CIVIL DETAIL I
18	C15	CIVIL DETAILS II
19	C16	CIVIL DETAILS III
ELECTRICAL		
20	E1	ELECTRICAL SITE PLAN AND NOTES
INSTRUMENTATION		
21	I 1	SYSTEM INTERCONNECTION PROCESS AND INSTRUMENTATION DIAGRAM



SHEET INDEX

SCALE: 1" = 400'

PRELIMINARY N.F.C.

USE OF DOCUMENTS

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN HCS

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

DRAWING AND SHEET LAYOUT INDEX

90% SUBMITTAL

FILE NAME 147000200G02

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET G2 OF 21

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GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CARMICHAEL DISTRICT CONSTRUCTION.
2. THE LOCATION, PIPE DIAMETER, AND MATERIAL INDICATED AND/OR ELEVATIONS OF UNDERGROUND UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE ONLY. NEITHER THE OWNER NOR THE ENGINEER ASSUMES RESPONSIBILITY FOR UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT ALL UTILITY COMPANIES SO THAT THOSE COMPANIES MAY MARK THE LOCATIONS OF THEIR LINES PRIOR TO PIPELINE INSTALLATION. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICES ALERT (USA) AT (800) 227-2600 IN ACCORDANCE WITH THE LAW PRIOR TO ALL EXCAVATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE EXISTING UTILITIES, WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS, AND TO FIELD VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION.
3. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS TO AVOID EXISTING UTILITIES. METHOD OF ADJUSTMENT SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
4. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.
5. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING SURFACE FEATURES, AND REPORT ANY DISCREPANCIES TO THE ENGINEER 5 DAYS IN ADVANCE OF CONSTRUCTION IN THAT AREA.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND FURNISH, INSTALL AND MAINTAIN TEMPORARY SIGNS. BARRICADES, FLAGMEN, AND OTHER FACILITIES TO ADEQUATELY SAFEGUARD THE GENERAL PUBLIC AND WORK, AND TO PROVIDE FOR THE PROPER ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC.
7. MECHANICAL EQUIPMENT USED ON THIS PROJECT SHALL BE SELECTED TO MINIMIZE DAMAGE TO THE EXISTING PAVEMENT ALONG THE PROJECT SITE AND TO ALL ROADS USED AS TRUCK ROUTES TO BRING MATERIAL AND EQUIPMENT TO THE PROJECT. THE CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, REPLACE DAMAGED AC PAVEMENT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
8. THE CONTRACTOR SHALL MAINTAIN VEHICLE ACCESS TO ALL PROPERTIES ADJACENT TO THE WORK THROUGHOUT THE PERIOD OF CONSTRUCTION. ONE ACCESS ROUTE TO ALL BUSINESSES ADJACENT TO THE WORK SHALL BE PROVIDED AT ALL TIMES. ALL EXCAVATIONS WILL BE PLATED OR BACKFILLED AT THE END OF EACH WORKDAY.
9. THE CONTRACTOR SHALL OBTAIN AN APPROVED ENCROACHMENT PERMIT AND TRAFFIC CONTROL PLAN FROM THE COUNTY OF SACRAMENTO AND CITY OF RANCHO CORDOVA FOR WORK WITHIN THE PUBLIC RIGHT OF WAY.
10. PRIOR TO GRADING, TRENCHING, CUTTING AND/OR FILLING WITHIN THE DRIP LINE OF TREES, THE CONTRACTOR SHALL COORDINATE WITH ENGINEER.
11. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL SURPLUS EXCAVATION MATERIAL AND DEBRIS PROMPTLY FROM THE SITE AND SHALL MAINTAIN THE SITE IN A NEAT AND ORDERLY CONDITION.
12. ALL DISTANCES SHOWN ON THE PLANS ARE HORIZONTAL MEASUREMENTS. ALL STATIONING REFERS TO BASELINE UNLESS OTHERWISE NOTED. GROUND PROFILE IS ALONG ROAD CENTERLINE UNLESS OTHERWISE NOTED.
13. THE CONTRACTOR SHALL PREPARE AND COMPLY WITH THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP). PER CALIFORNIA STATE WATER RESOURCES CONTROL BOARD CONSTRUCTION ACTIVITIES STORM WATER PERMIT NO. 2009-0009-DWS.
14. THE CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS DURING CONSTRUCTION. ALL SUCH MONUMENTS OR MARKERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
15. THE CONTRACTOR MUST OBTAIN WRITTEN PERMISSION FROM THE OWNER OF ANY PRIVATELY OWNED PROPERTY PRIOR TO BEGINNING ANY WORK. STORING MATERIALS OF OTHERWISE CONDUCTING ANY OPERATIONS ON SAID PROPERTY, THE WRITTEN APPROVAL FROM THE PROPERTY OWNER MUST BE ON FILE WITH THE DISTRICT BEFORE ANY OPERATIONS WILL BE PERMITTED ON SAID PROPERTY.
16. ANY DISTRICT OR PRIVATE PROPERTY INCLUDING LANDSCAPING, IRRIGATION OR OTHER IMPROVEMENTS, WHICH IS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE DISTRICT AND TO THE SATISFACTION OF THE ENGINEER.
17. THE CONTRACTOR IS RESPONSIBLE FOR HAVING A COMPLETE SET OF CONTRACT PLANS AND SPECIFICATIONS, CITY PERMITS, AND THE LATEST GOVERNING STANDARD SPECIFICATIONS AT THE PROJECT SITE DURING WORKING HOURS.
18. THE CONTRACTOR SHALL KEEP UP-TO-DATE A COMPLETE RECORD SET OF RED-LINED PRINTS OF THE CONTRACT DRAWINGS SHOWING EVERY CHANGE FROM THE ORIGINAL DRAWINGS MADE DURING THE COURSE OF CONSTRUCTION. INCLUDING EXACT LOCATIONS, SIZES, MATERIALS, AND EQUIPMENT. A COMPLETE SET OF CORRECTED AND COMPLETED RECORD DRAWINGS SHALL BE SUBMITTED TO THE DISTRICT PRIOR TO FINAL ACCEPTANCE OF THE SYSTEM.
19. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL POWER, UTILITIES, AND TEMPORARY FACILITIES THAT ARE NECESSARY TO COMPLETE THE WORK.
20. NO TRENCHING WHATSOEVER SHALL BE ALLOWED WITHIN THE DRIPLINES OF EXISTING TREES NOT AUTHORIZED FOR REMOVAL WITHOUT AUTHORIZATION FROM THE DISTRICT. INCLUDING ISSUANCE OF AN APPROVED TREE PERMIT ISSUED BY THE DISTRICT ARBORIST IF NECESSARY. IF IT IS NECESSARY TO INSTALL UNDERGROUND UTILITIES WITHIN THE DRIPLINE OF AN EXISTING TREE NOT AUTHORIZED FOR REMOVAL THE UTILITY LINE SHALL BE EITHER BORED OR DRILLED. IF THE BORING OR DRILLING IS DETERMINED TO BE IMPOSSIBLE BY THE ENGINEER, THE UTILITY LINE TRENCH MAY BE HAND DUG UNDER THE DIRECT SUPERVISION OF A CERTIFIED ARBORIST.
21. THE CONSTRUCTION WORK HOURS FOR THIS PROJECT ARE LIMITED TO MONDAY THROUGH FRIDAY, 7:00 AM TO 6:00 PM. CONSTRUCTION IS PROHIBITED ON SUNDAYS, SITH/FEDERAL HOLIDAYS, AND PER SPECIFICATIONS, EXCEPT WITH WRITTEN PERMISSION OF THE DISTRICT. REQUEST MUST BE SUBMITTED IN WRITING TO TEH OWNER'S REPRESENTATIVE AT LEAST TWO (2) DAYS UN ADVANCE IT THE INTENDED WORK. IN CASE OF EMERGENCY THE CONTRACTOR WILL BE ALLOWED TO WORK AT NIGHT OR ON SUNDAYS OR LEGAL HOLIDAYS, BUT MUST NOTIFY TO OWNER'S REPRESENTATIVE IMMEDIATELY.

SYMBOLS

GENERAL CIVIL	NEW	EXISTING
SPOT ELEVATION	18.00	x 35.5
INTERMEDIATE CONTOUR		
INDEX CONTOUR	120	120
TREE		
BUILDING		
ABANDONED WATERLINE		(A)W (A)W
WATERLINE	W W	W W
OVER HEAD ELECTRICAL	OH OH	OH OH
ELECTRICAL LINE	E E	E E
STORM DRAIN	SD SD	SD SD
SANITARY SEWER	SS SS	SS SS
GAS	G G	G G
STORM DRAIN	SD SD	SD SD
CABLE TV	TV TV	TV TV
RIGHT-OF-WAY		
EASEMENT		
EDGE OF PAVEMENT		
FLOWLINE		
PROPERTY LINE		
FENCE	X X	X X
CENTERLINE		
TO BE REMOVED		
UNDISTURBED EARTH (IN SECTION)		
SLOPING GRADE (IN PLAN)	HIGH LOW	HIGH LOW
CATCH BASIN		
MANHOLE		
CONCRETE		(E) CONC
ASPHALTIC CONCRETE PAVEMENT (IN SECTION)		(E) AC
AGGREGATE BASE (IN SECTION)		(E) AB
EDGE OF PAVEMENT (IN PLAN)		
SERVICE POLE	S.P.	
JOINT UTILITY POLE	J.P.	
STREET LIGHT		
FIRE HYDRANT		
WATER VALVE		
WATER BOX		
GAS METER		
MAILBOX		
SEWER CLEANOUT		
PROJECT BENCHMARK	BM	
AIR RELEASE VALVE		
BLOW OFF VALVE		

ABBREVIATIONS

&	AND
∠	ANGLE
@	AT
"	INCH SUPERSCRIPT
ï	PHASE, DIAMETER
AB	ANCHOR BOLT, AGGREGATE BASE
AC	ASBESTOS CEMENT
A/C	ASPHALT CONCRETE
ALUM	ALUMINUM
APPROX	APPROXIMATE (-LY)
ARV	AIR RELIEF/VACUUM VALVE
AVG	AVERAGE
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BM	BENCH MARK
BLDG	BUILDING
BO	BLOW OFF VALVE
BS	BLACK STEEL
BVC	BEGIN VERTICAL CURVE
CAV	COMBINATION AIR VALVE
CB	CATCH BASIN
CI	CAST IRON
CIP	CAST IRON PIPE
℄, ℄	CENTERLINE
CY	CUBIC YARD
CLR	CLEAR (-ANCE)
COL	COLUMN
CONC	CONCRETE
CONN	CONNECT (-S, -TION)
CONST	CONSTRUCT (-TION)
CONT	CONTINU (-ED, -OUS)
CU	COPPER
(D)	DEMOLISH
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIM	DIMENSION
DISTRICT	CARMICHAEL WATER DISTRICT
DWG	DRAWING
(E)	EXISTING
EA	EACH
EL	ELEVATION
ELEC	ELECTRIC (-AL)
ELEV	ELEVATION
ENCL	ENCLOSURE
ENGR	ENGINEER
EP, EOP	EDGE OF PAVEMENT
EQUIP	EQUIPMENT
ETC	ET CETERA
EVC	END VERTICAL CURVE
EXIST, (E)	EXISTING
EXP JT	EXPANSION JOINT
EXT	EXTERIOR
(F)	FUTURE
FC	FAIL CLOSED
FT	FEET (FOOT)
FC	FLEXIBLE COUPLING
FCA	FLANGED COUPLING ADAPTER
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FM	FLOW METER
FIN GD	FINISH GRADE
FLEX	FLEXIBLE
FLGD	FLANGED
FO	FAIL OPEN
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GS	GALVANIZED STEEL
GV	GATE VALVE
GAL	GALLON
GALV	GALVANIZE
GEN	GENERATOR
GND	GROUND
GP	GUARD POST
HB	HOSE BIBB
HT	HEIGHT
HORIZ	HORIZONTAL
HP	HORSEPOWER
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
INV	INVERT
IRR	IRRIGATION
JB	JUNCTION BOX
LCP	LOCAL CONTROL PANEL
LTG	LIGHTING
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MJ	MECHANICAL JOINT
MATL, MTL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MPT	MALE PIPE THREAD
MW	MONITORING WELL
(N)	NEW
N	NORTH
NC	NORMALLY CLOSED
NFC	NOT FOR CONSTRUCTION
ND	NON-DETECT
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
N.T.S.	NOT TO SCALE
N/A	NOT APPLICABLE
NOM	NOMINAL
NP	NON-POTABLE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OVERFLOW
P	PIPE
PC	POINT OF HORIZONTAL CURVE
PCC	POINT OF COMPOUND CURVE
PG	PRESSURE GAUGE ASSEMBLY
PPB	PARTS PER BILLION, MICROGRAMS PER LITER
PPT	PARTS PER TRILLION, NANOGRAMS PER LITER
PL, P̄L	PROPERTY LINE
POT	POINT OF TANGENCY
PP	POWER POLE
PROP	PROPOSED
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH-GAUGE
PVI	POINT OF VERTICAL INTERSECTION
PVC	POLYVINYL CHLORIDE
R	RADIUS
(R)	RELOCATE
RCP	REINFORCED CONCRETE PIPE
RR	RAILROAD
R/W	RIGHT-OF-WAY
RED	REDUCE (R)
REF	REFERENCE
REINF	REINFORCING (-MENT)
REQ'D	REQUIRED
SA	SAMPLE TAP
SCHED	SCHEDULE
SECT	SECTION
SHT, SH	SHEET
SF, S.F.	SQUARE FEET
SIM	SIMILAR
SPEC	SPECIFICATION
SQ.	SQUARE
IN2	SQUARE INCHES
SS	STAINLESS STEEL, SANITARY SEWER
STA	STATION
STD	STANDARD
SURF	SURFACE
SWBD	SWITCH BOARD
T	TYPE
TB	THRUST BLOCK
TBD	TO BE DETERMINED
TBM	TEMPORARY BENCH MARK
TOC	TOP OF CURB
TEL	TELEPHONE
THK.	THICK
T.O.P.	TOP OF PAVEMENT
T.O.S.	TOP OF SLAB
TYP	TYPICAL
UG	UNDERGROUND
V	VENT
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VTR	VENT THROUGH ROOF
W	WIDTH; WIDE
WP	WEATHER PROTECTED
WS	WELDED STEEL
WSP	WELDED STEEL PIPE
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
W/	WITH
W/O	WITHOUT

VALVE SYMBOLS

DESCRIPTION	SINGLE LINE	DOUBLE LINE
GATE VALVE		
GLOBE VALVE		
PLUG VALVE		
SWING CHECK VALVE		
BUTTERFLY (WAFER) VALUE		
BALL VALVE		
DIAPHRAGM VALVE		
CONTROL VALVE (ELEVATION)		
CONTROL VALVE (PLAN)		
HOSE BIBB	HB	
MAGMETER	M	M

SURVEY CONTROL NOTES

ANDREGG GEOMATICS
11661 BLOCKER DR, STE 200
AUBURN, CA 95603
1-530-885-7072

A PORTION OF RANCHO RIO DE LOS AMERICANOS,
T.9 N., R. 6 E., M.D.B. & M.
SACRAMENTO COUNTY, CALIFORNIA

HORIZONTAL DATUM:
CALIFORNIA STATE PLANE COORDINATE
NAD83(2004.69), ZONE 2

VERTICAL DATUM:
NGVD29 BASED ON BENCH MARK
'RANCHO CORDOVA'; ELEV 96.37 FEET

REFERENCE SYMBOLS

SECTION TITLE
SCALE: NTS
A — SECTION DESIGNATION
M3 — SHEET DRAWN ON

DETAIL TITLE
SCALE: NTS
1 — DETAIL DESIGNATION
M3 — SHEET DRAWN ON

A — SECTION DESIGNATION
C3 — SHEET DRAWN ON
A

SECTION

PRELIMINARY N.F.C.

NO.	REVISION	DATE	BY

SCALES
0 1"
0 25mm
IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY
DRAWN HCS
CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

GENERAL NOTES, LEGEND, ABBREVIATIONS AND SURVEY NOTES

90% SUBMITTAL

FILE NAME 147000200G03
JOB NO. 1470002*00
DATE AUGUST 2014
SHEET G3 OF 21

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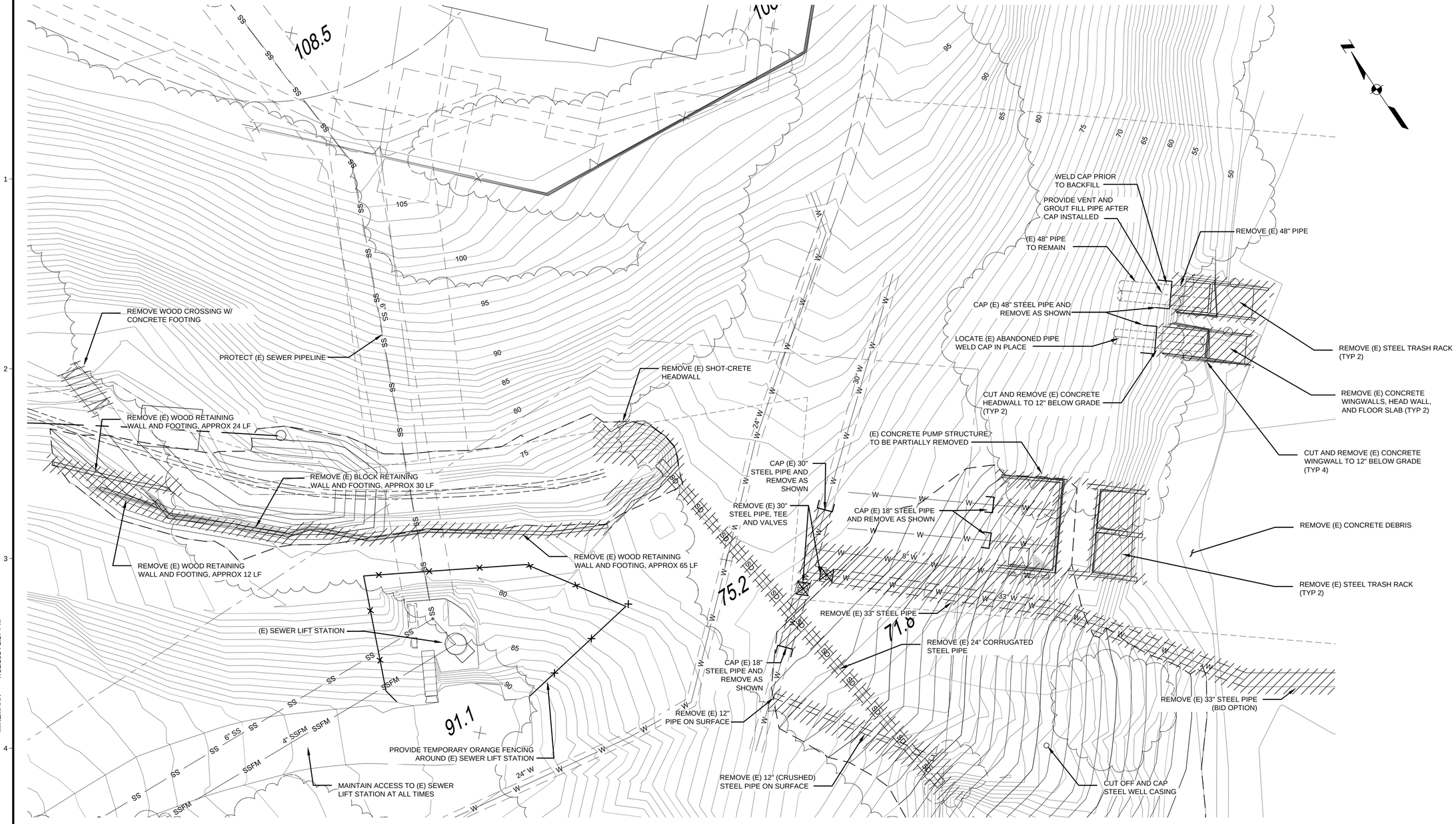

PLAN

0 10 20

1"=10'

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER SARAH A. LAYBOURNE No. 81438 Exp.09/30/13 CIVIL STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

DEMOLITION PLAN

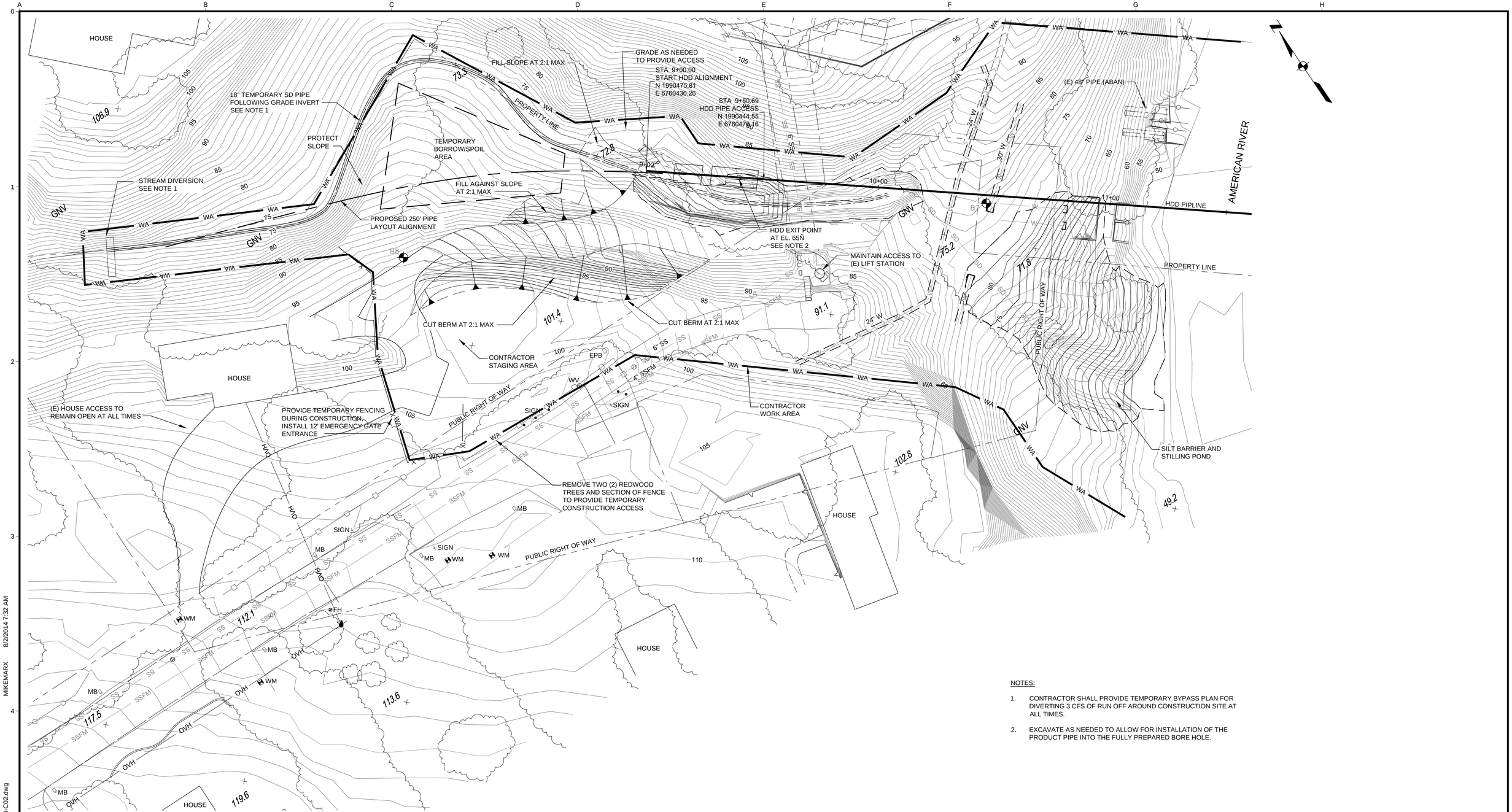
90% SUBMITTAL

FILE NAME 147000200-C01

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C1 OF 21



NOTES:

1. CONTRACTOR SHALL PROVIDE TEMPORARY BYPASS PLAN FOR DIVERTING 3 CFS OF RUN OFF AROUND CONSTRUCTION SITE AT ALL TIMES.
2. EXCAVATE AS NEEDED TO ALLOW FOR INSTALLATION OF THE PRODUCT PIPE INTO THE FULLY PREPARED BORE HOLE.

PLAN

0 10 20 30

1"=20'

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

SITE ACCESS AND GRADING - NORTH BANK

90% SUBMITTAL

FILE NAME 147000200-C03

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C2 OF 21

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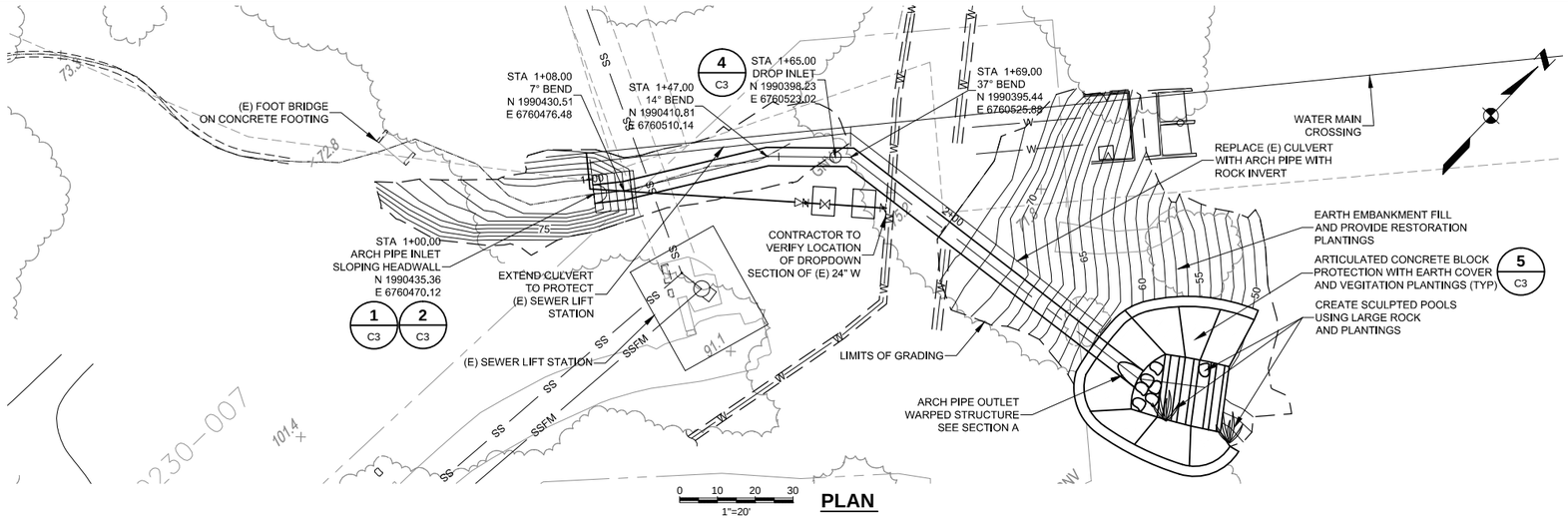
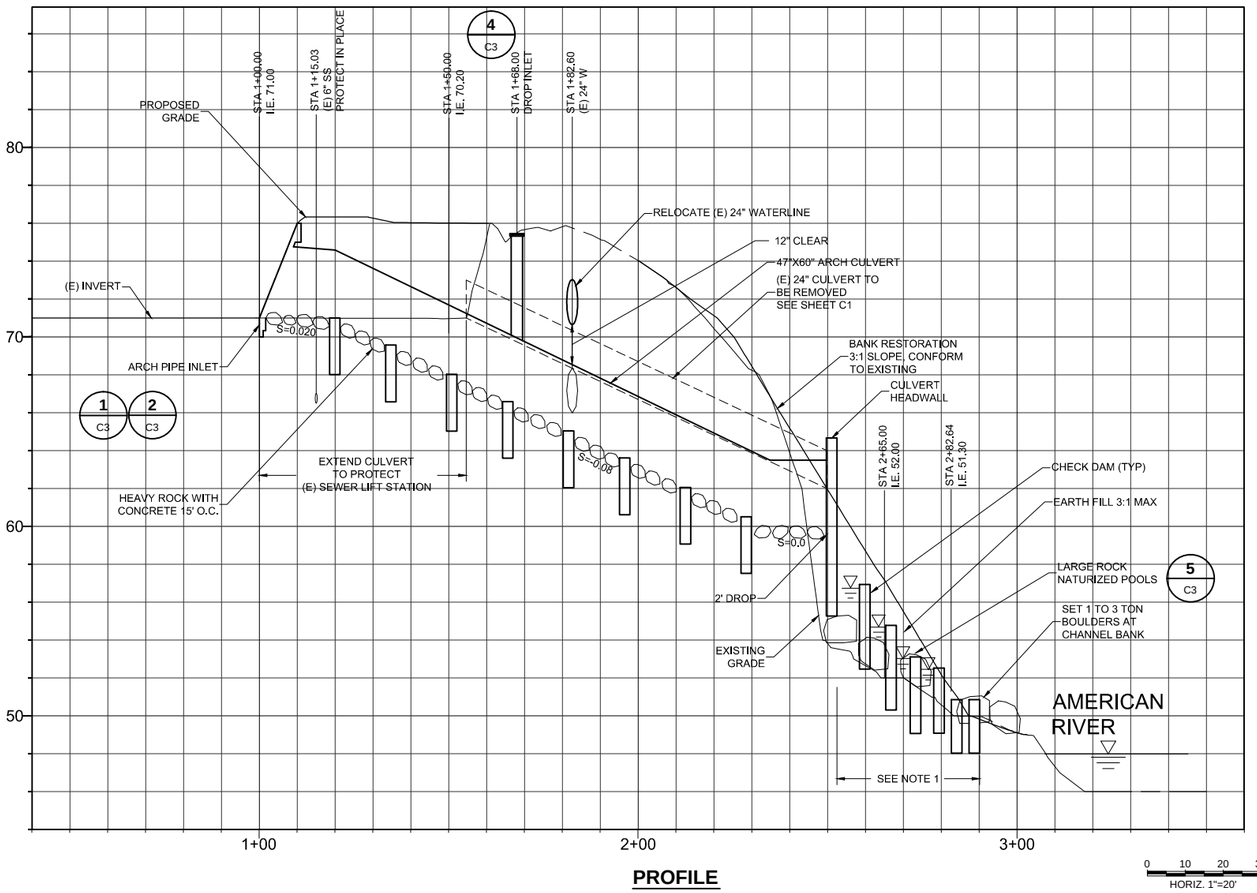
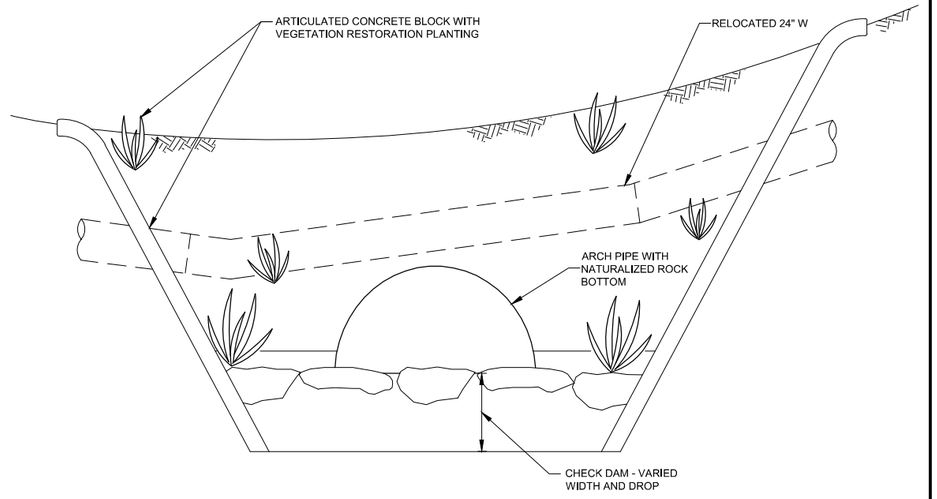


PLAN



PROFILE



SECTION A

NOTES:
1. STEPPED PONDS RANGING IN SIZE AND DROP.

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES
0 1"
0 25mm
IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY
DRAWN LMM
CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

ENVIRONMENTAL RESTORATION - NORTH BANK

90% SUBMITTAL

FILE NAME 147000200-C03
JOB NO. 1470002*00
DATE JULY 2014
SHEET C3 OF 20

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ADDITIONAL CONTRACTOR STAGING AREA IN PARKING LOT, BOAT RAMP ACCESS TO REMAIN OPEN AT ALL TIMES

CONTRACTOR STAGING AREA

2:1 CUT SLOPE ALONG ROAD EDGE

CONTRACTOR STAGING AREA

BEGIN STEEL CONDUCTOR CASING

ROSSMOOR DRIVE

19+00

20+00

250' OF SINGLE LANE ROAD CLOSURE

HDD PIPELINE

STA 20+00.00
BEGIN HDD
N 1989797.44
E 6761302.17

TEMPORARY CONSTRUCTION PAD ELEV. 75'

ENVIRONMENTAL PROTECTION BARRIER

2:1 TEMPORARY SLOPE FILL

CONSTRUCTION PLAN

0 10 20 30
1"=20'

REINSTALL 8X8 POST AND CABLE BARRIER

REGRADE SURFACE TO MATCH EXISTING

REINSTALL SIGN

RECONSTRUCT ROAD AS NEEDED

SCARIFY TO 12" AND GRADE TO NATURAL CONTOUR HYDRO SEED WITH NATIVE MIX

SCARIFY TO 12" AND GRADE TO NATURAL CONTOUR HYDRO SEED WITH NATIVE MIX

ROSSMOOR DRIVE

WA

REGRADE SLOPE CONFORMING TO MATCH EXISTING, TOP DRESS WITH 12", 3" TO 9" COBBLES

CONTRACTOR WORK AREA

POST-CONSTRUCTION PLAN

0 10 20 30
1"=20'

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"
0 25mm

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY
DRAWN LMM
CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

HDD GRADING PLAN SOUTH BANK

90% SUBMITTAL

FILE NAME 147000200-C04
JOB NO. 1470002*00
DATE AUGUST 2014
SHEET C4 OF 21

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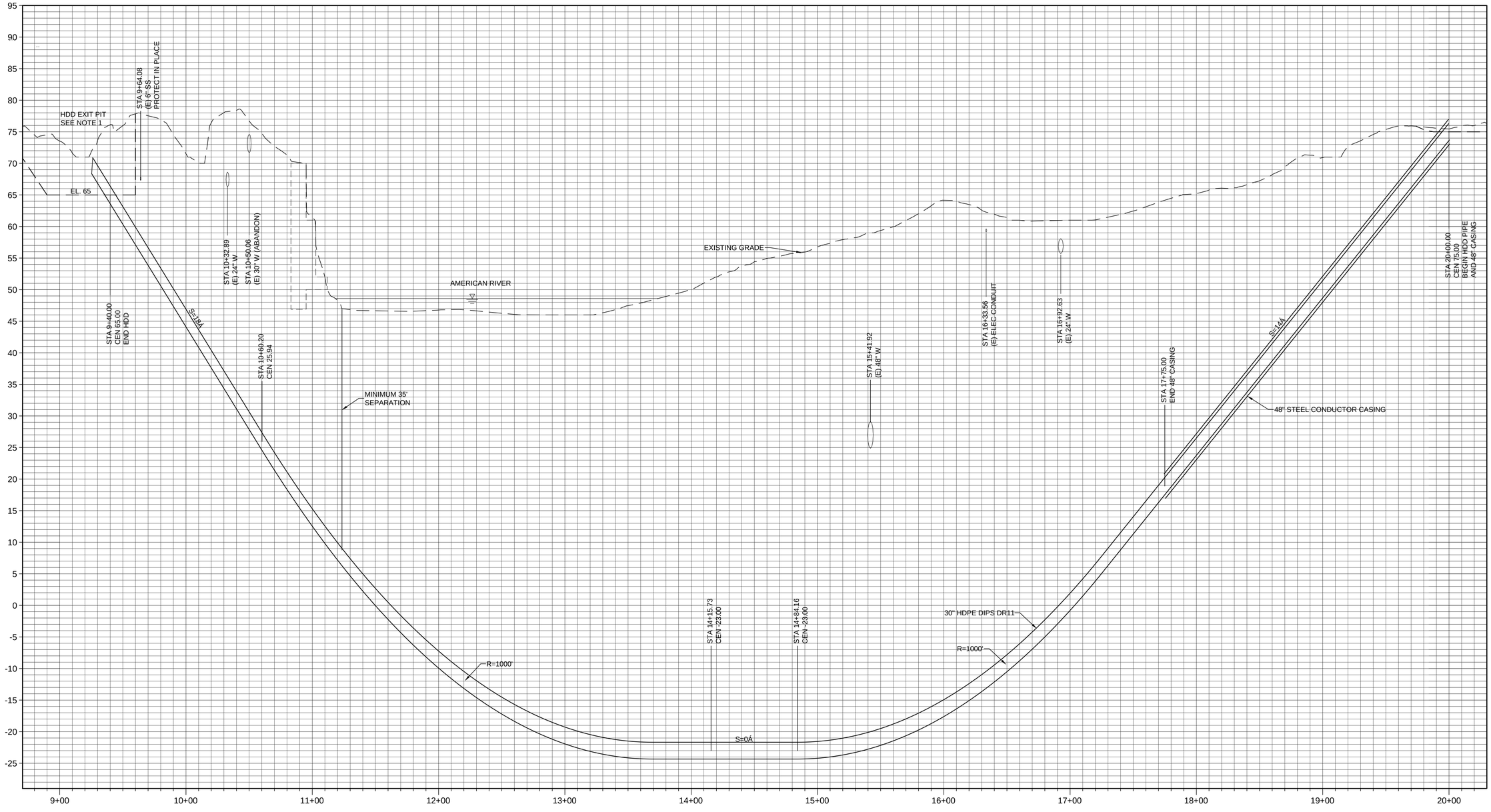

PROFILE

0 20 40 60

HORIZ. 1"=40'

0 4 8

VERT. 1"=8'

NOTES:

1. EXCAVATE AS NEEDED TO ALLOW FOR INSTALLATION OF THE PRODUCT PIPE INTO THE FULLY PREPARED BORE HOLE.

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

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RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

HDD PROFILE

90% SUBMITTAL

FILE NAME 147000200-C05

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C5 OF 21

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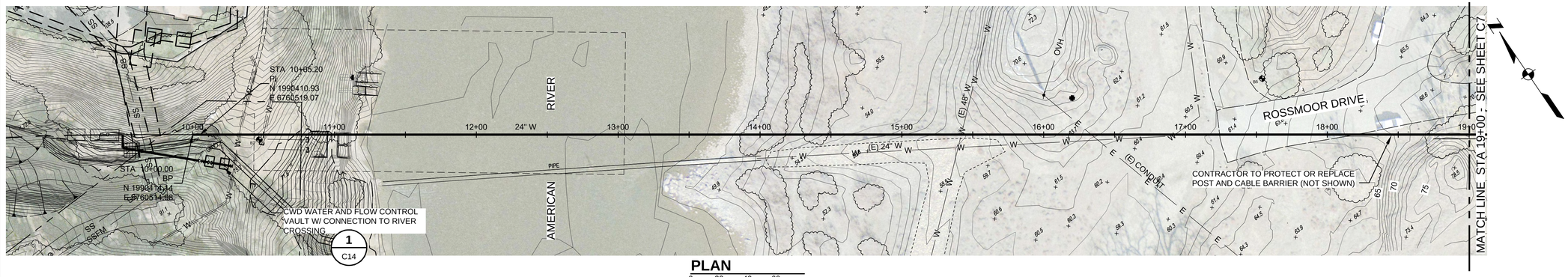
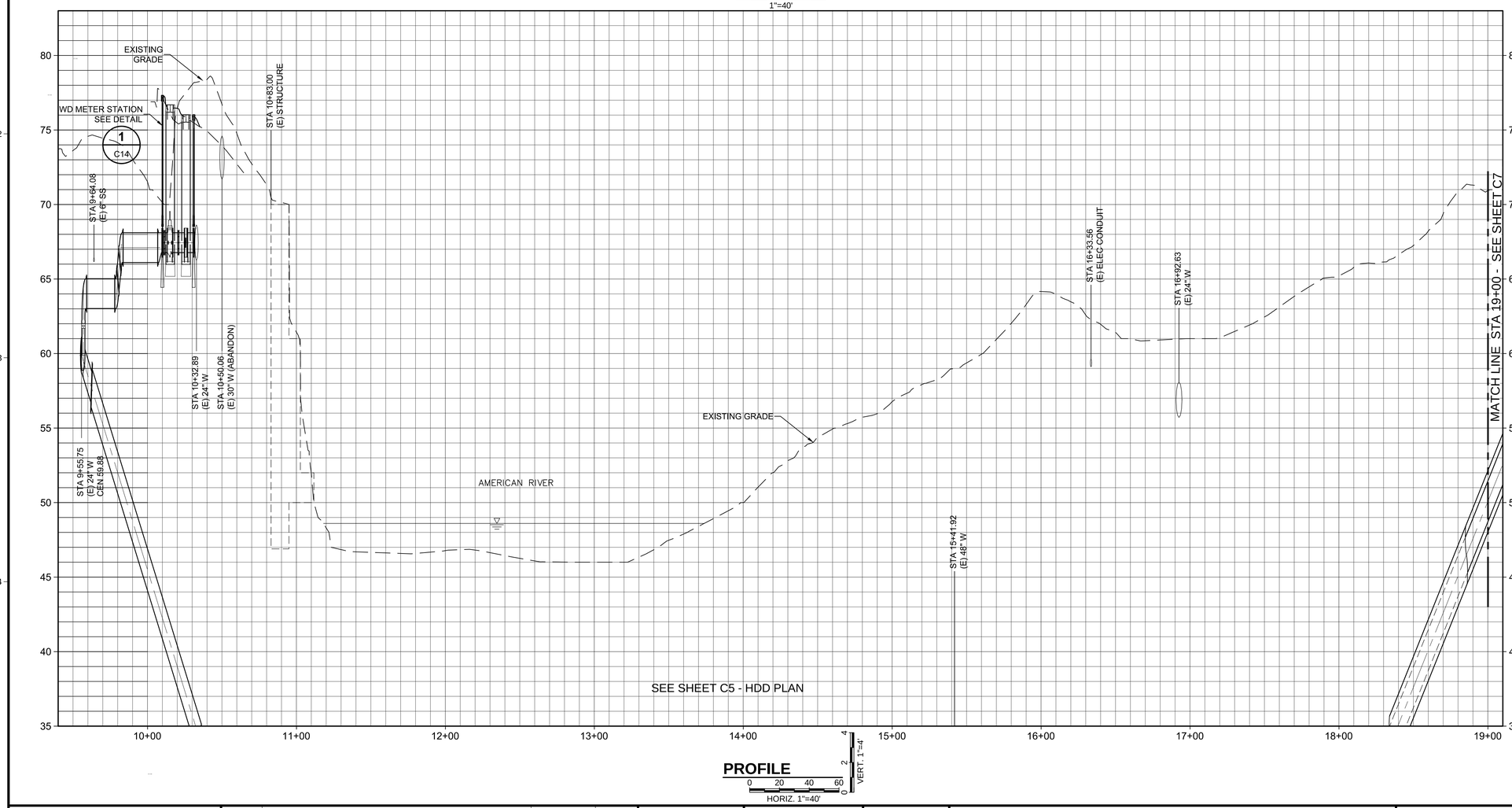


PLAN

0 20 40 60

1"=40'



PROFILE

0 20 40 60

HORIZ. 1"=40'

0 2 4

VERT. 1"=4'

PRELIMINARY N.F.C.

NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

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RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN HCS

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

PLAN AND PROFILE STA. 10+00 TO 19+00

90% SUBMITTAL

FILE NAME 147000200-C06

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C6 OF 21

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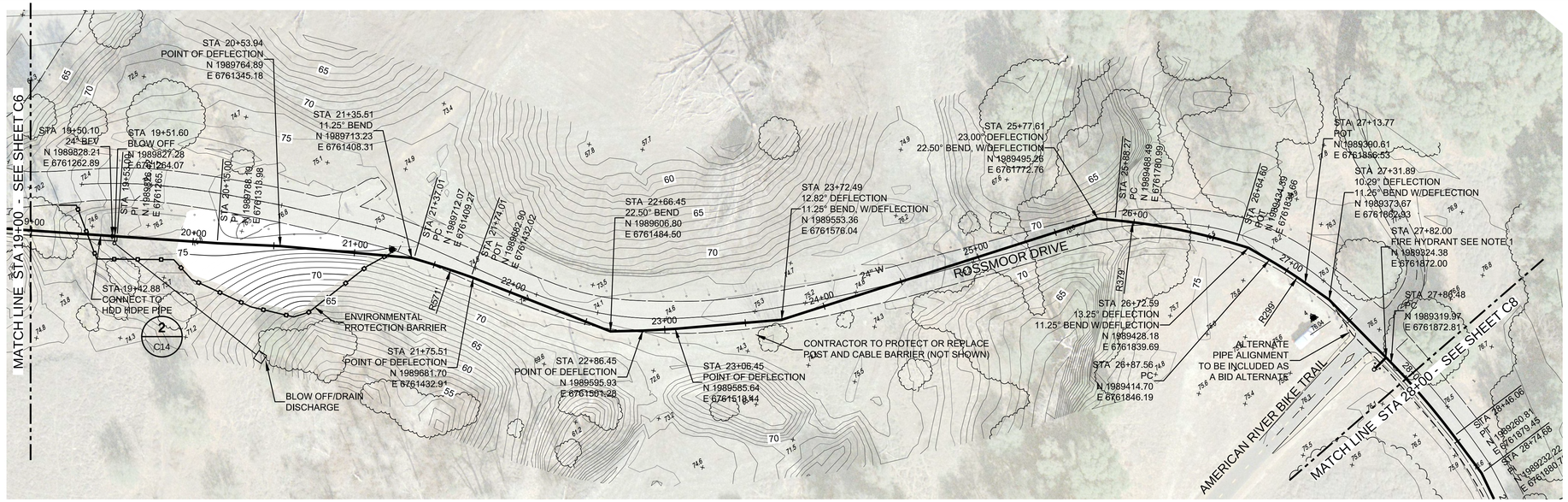
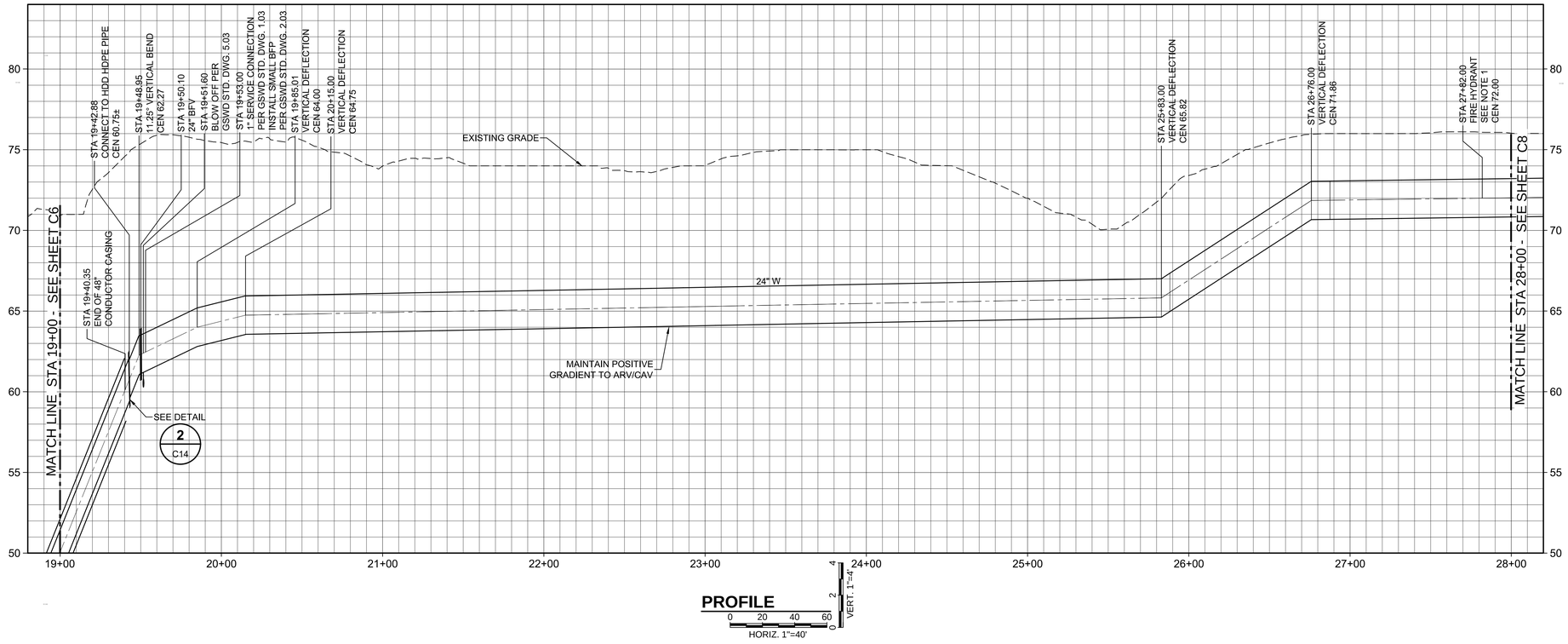


PLAN

0 20 40 60

1"=40'



PROFILE

0 20 40 60

HORIZ. 1"=40'

0 2 4

VERT. 1"=4'

NOTES:

1. INSTALL FIRE HYDRANT AND BOLLARDS PER STANDARD DRAWINGS 4.01 AND 4.03. INSTALL A 1" TAP FOR DRINKING FOUNTAIN.

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

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REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

PLAN AND PROFILE STA. 19+00 TO 28+00

90% SUBMITTAL

FILE NAME 147000200-C07

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C7 OF 21

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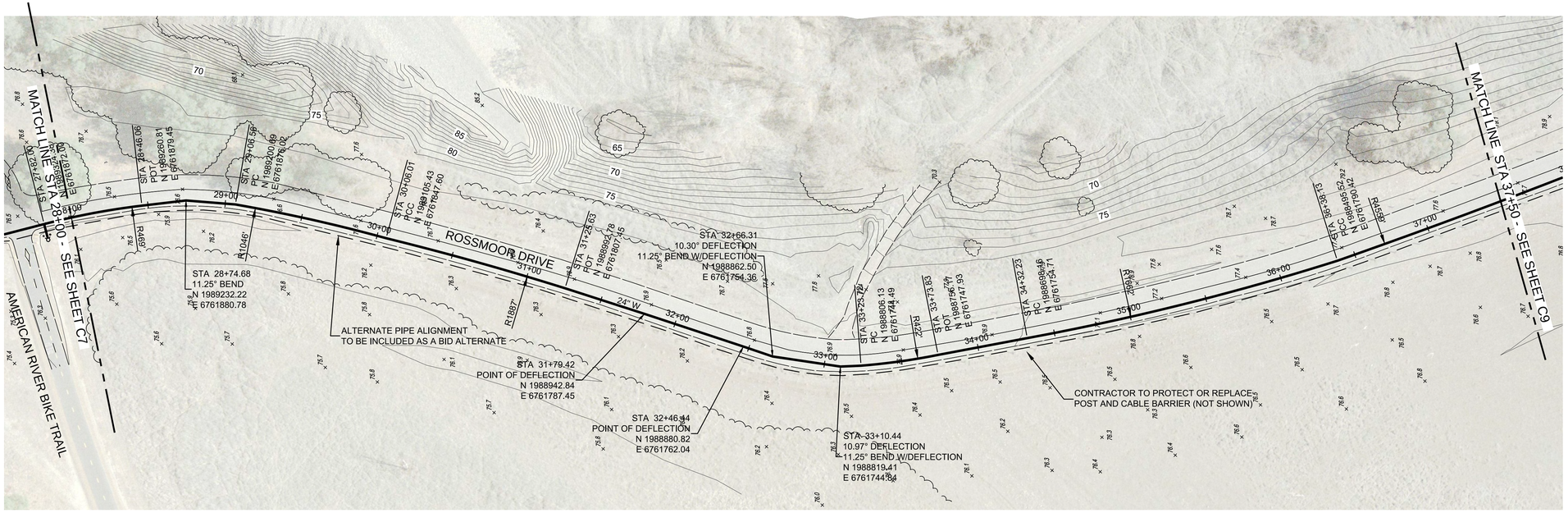
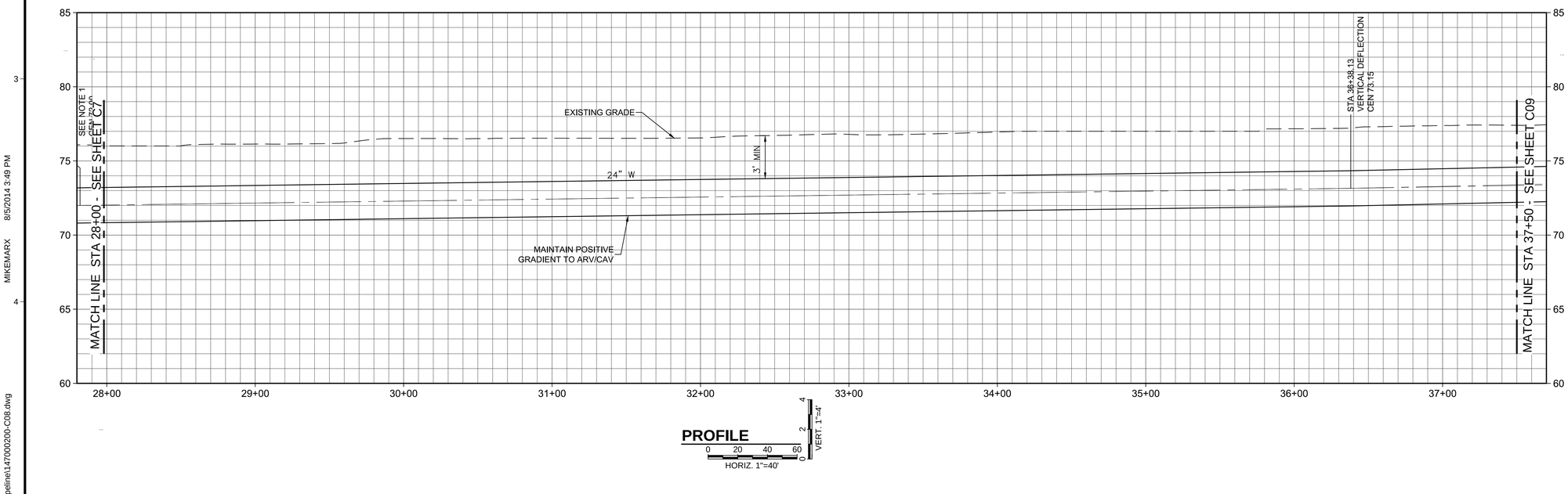


PLAN

0 20 40 60

1"=40'



PROFILE

0 20 40 60

HORIZ. 1"=40'

0 2 4

VERT. 1"=4'

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

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REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

PLAN AND PROFILE STA. 28+00 TO 37+50

90% SUBMITTAL

FILE NAME 147000200-C08

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET **C8** OF 21

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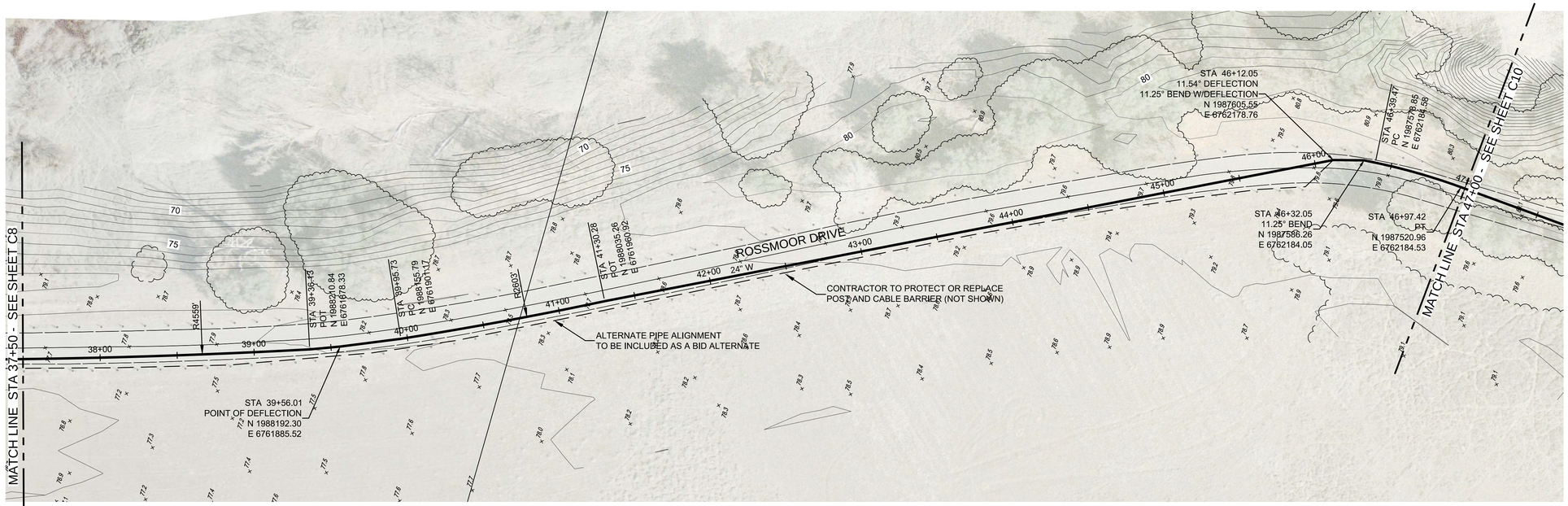
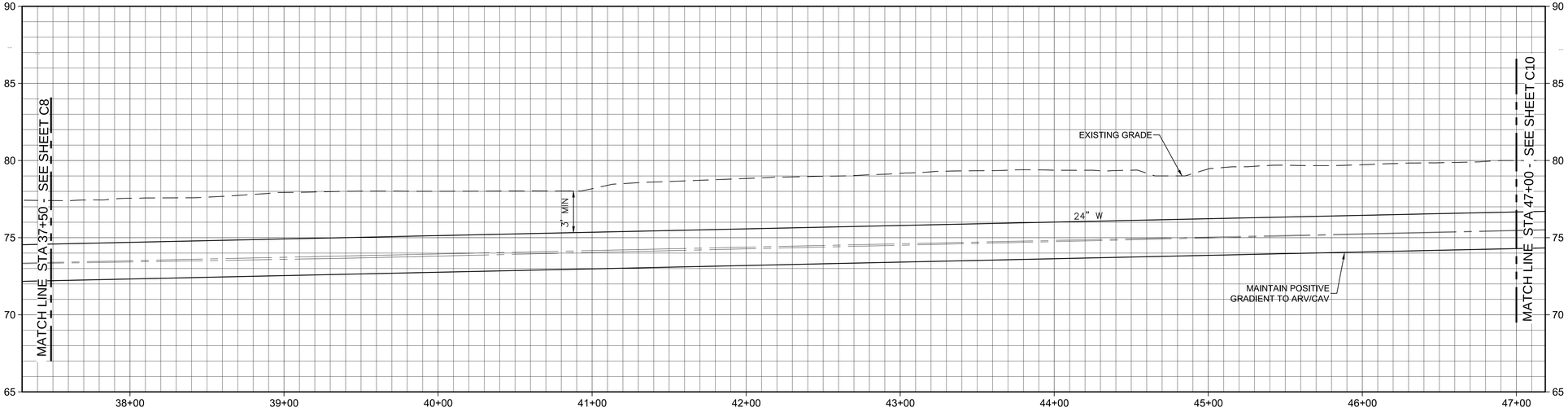


PLAN

0 20 40 60

1"=40'



PROFILE

0 20 40 60

HORIZ. 1"=40'

0 2 4

VERT. 1"=4'

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

PLAN AND PROFILE STA. 37+50 TO 47+00

90% SUBMITTAL

FILE NAME 147000200-C09

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C9 OF 21

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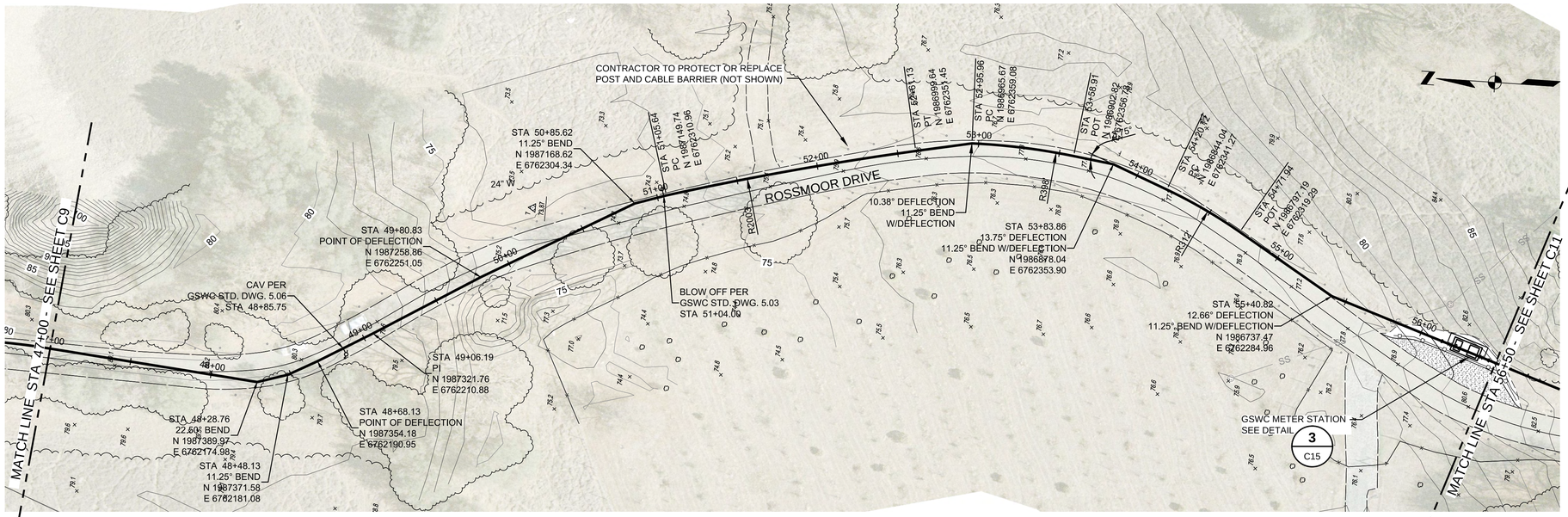

PLAN

0 20 40 60

1"=40'

PROFILE

0 20 40 60

HORIZ. 1"=40'

0 2 4

VERT. 1"=4'

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

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RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

PLAN AND PROFILE STA. 47+00 TO 56+50

90% SUBMITTAL

FILE NAME 147000200-C10

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET **C10** OF 21

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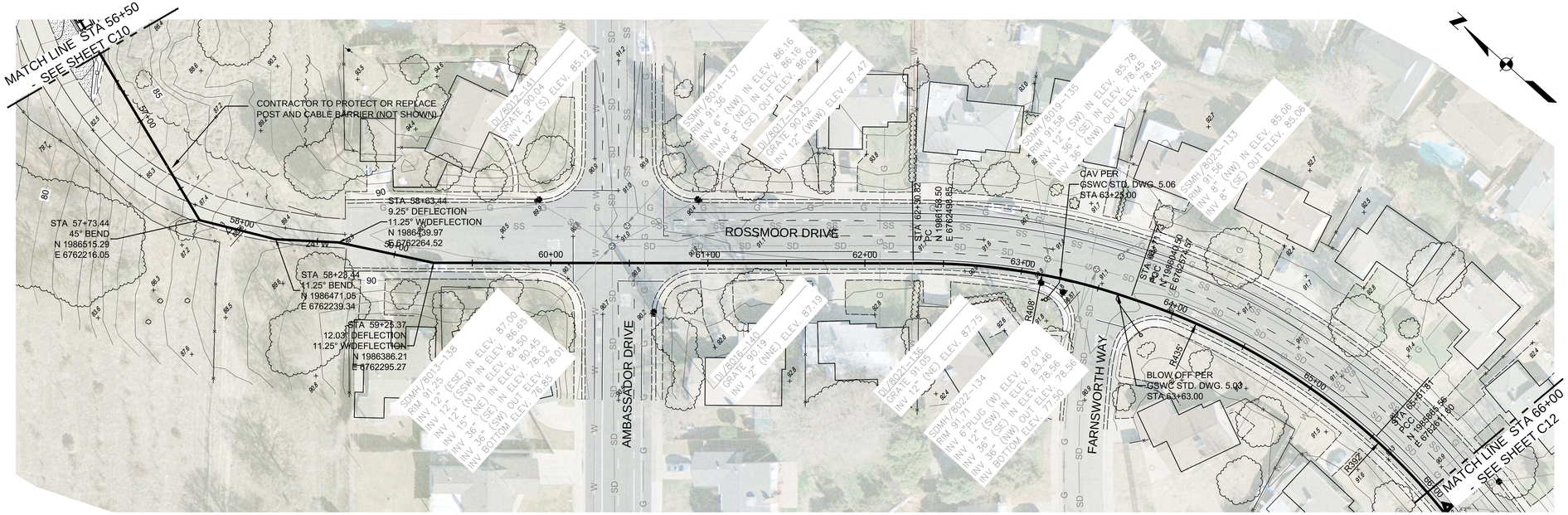
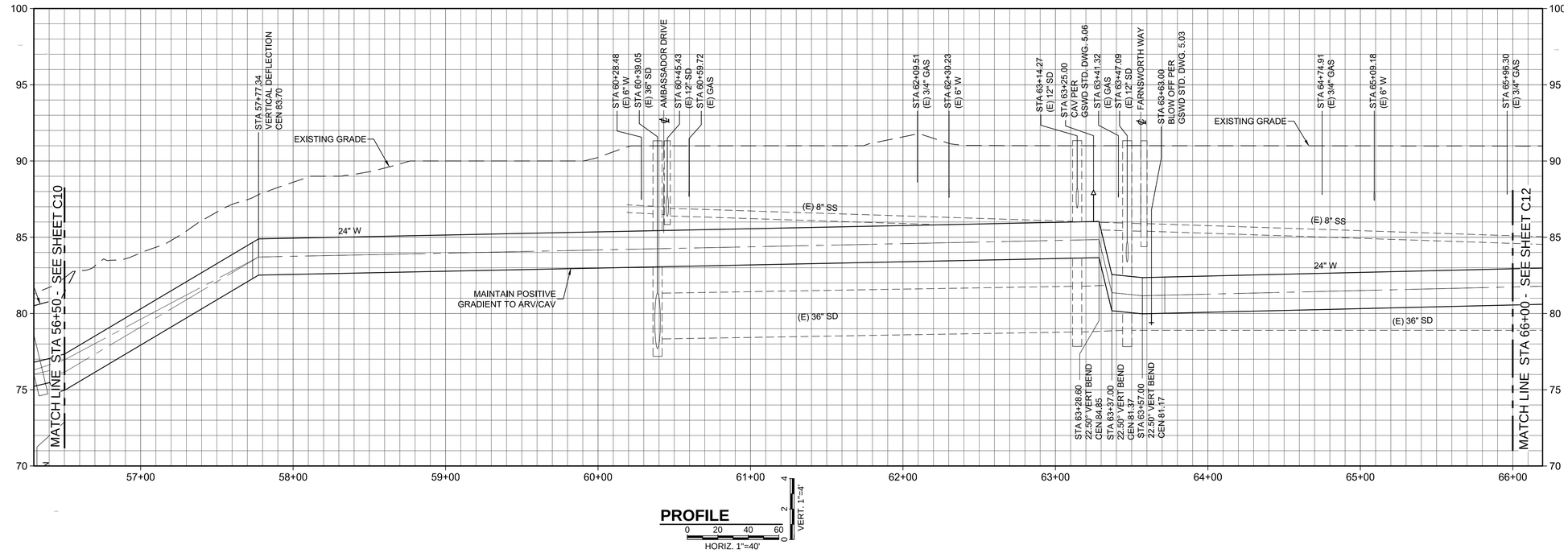


PLAN

0 20 40 60

1"=40'



PROFILE

0 20 40 60

HORIZ. 1"=40'

0 2 4

VERT. 1"=4

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

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REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

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CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

PLAN AND PROFILE STA. 56+50 TO 66+00

90% SUBMITTAL

FILE NAME 147000200-C11

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C11 OF 21

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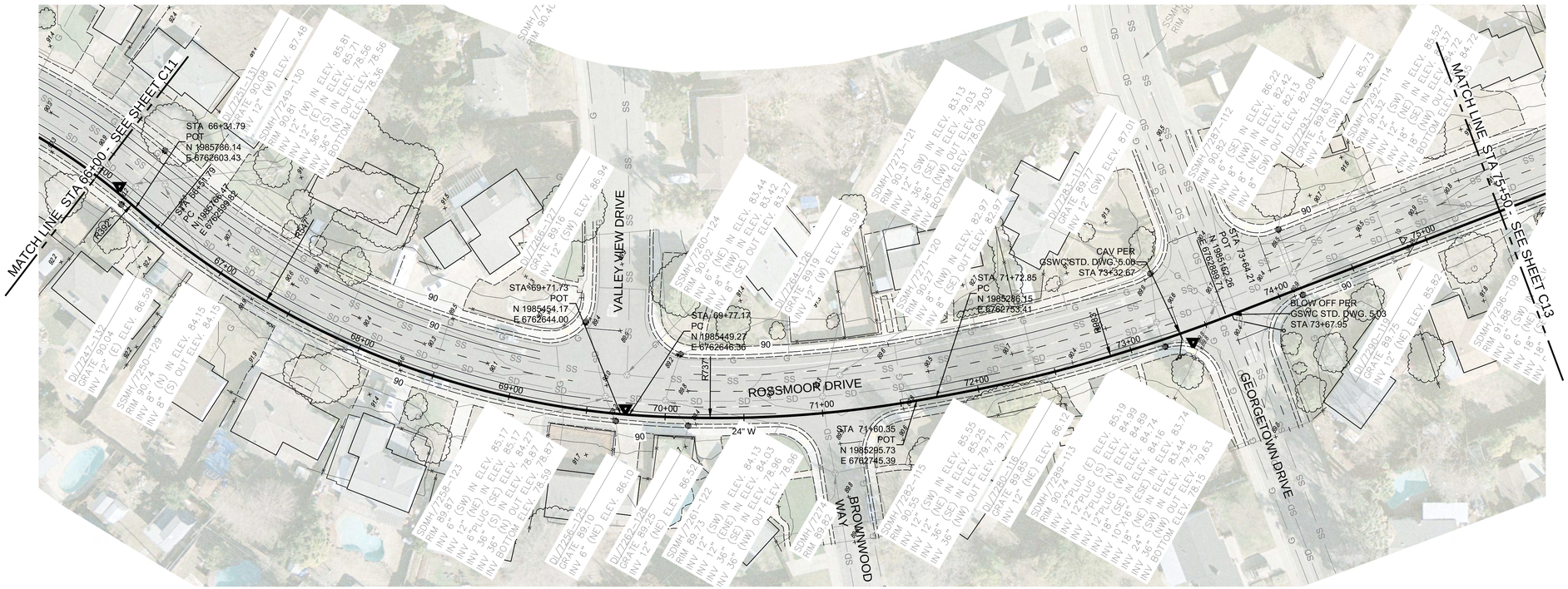

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

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REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED	RSY
DRAWN	LMM
CHECKED	ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

PLAN AND PROFILE STA. 66+00 TO 75+50

90% SUBMITTAL

FILE NAME	147000200-C12
JOB NO.	1470002*00
DATE	AUGUST 2014
SHEET	C12
OF	21

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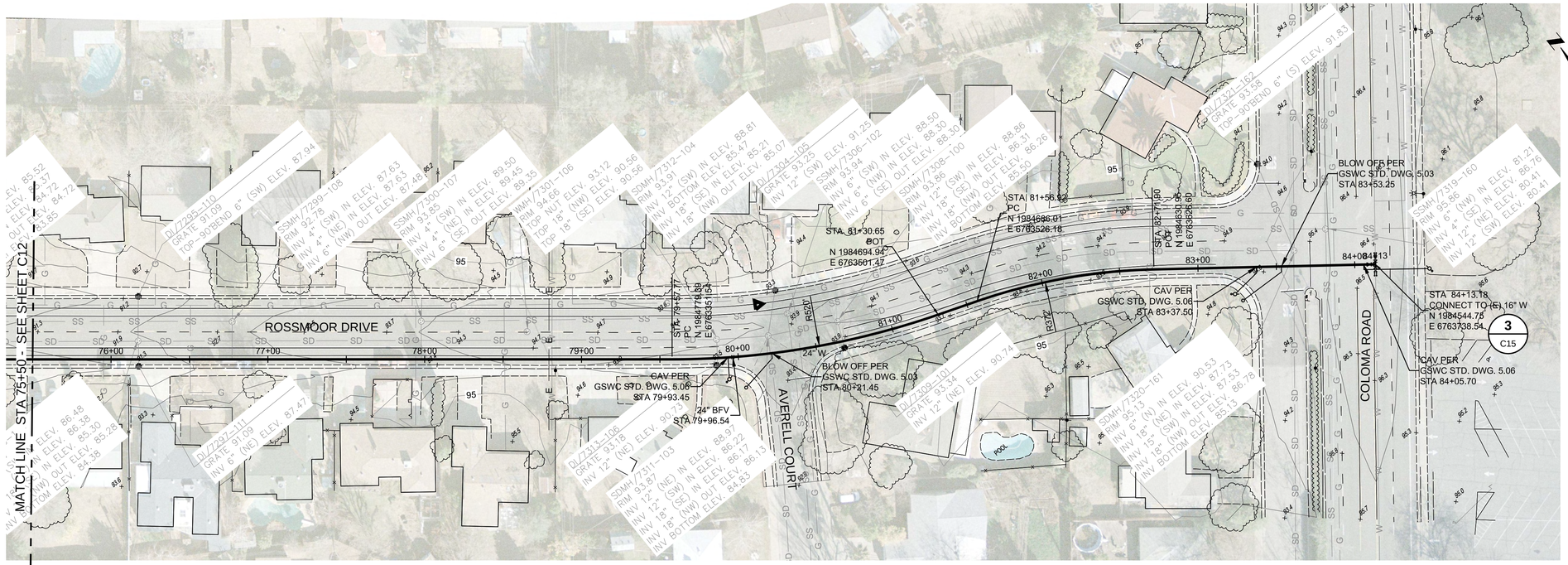

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SCALES

0 1"

0 25mm

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RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

PLAN AND PROFILE STA. 75+50 TO 84+13.18

90% SUBMITTAL

FILE NAME 147000200-C13

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C13 OF 21

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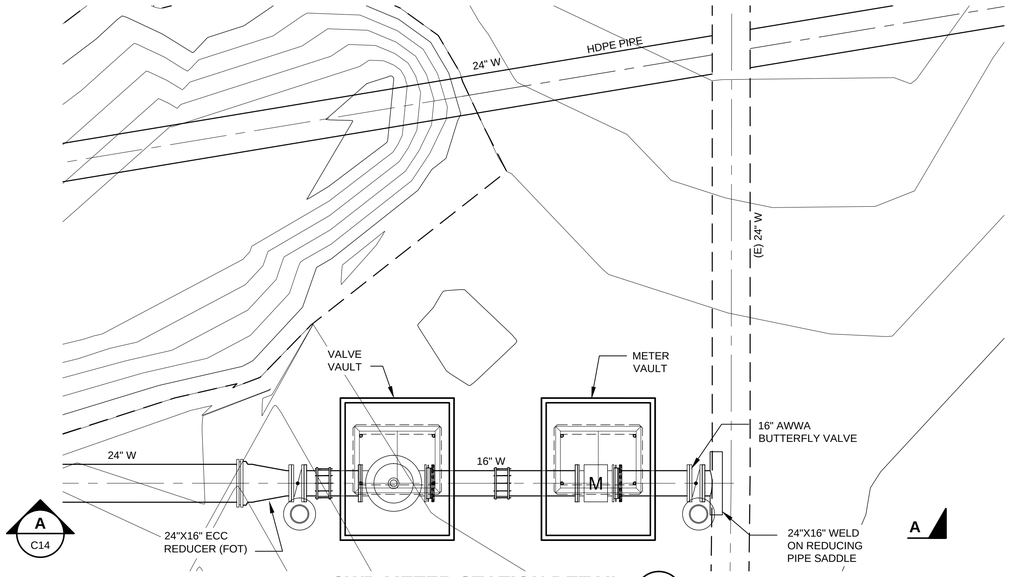
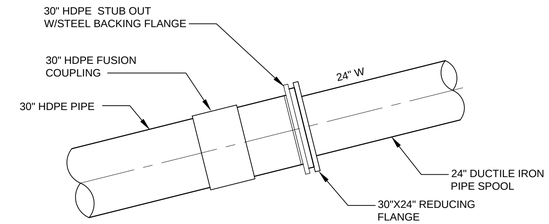


CWD METER STATION DETAIL 1 / C6

0 4' 8'

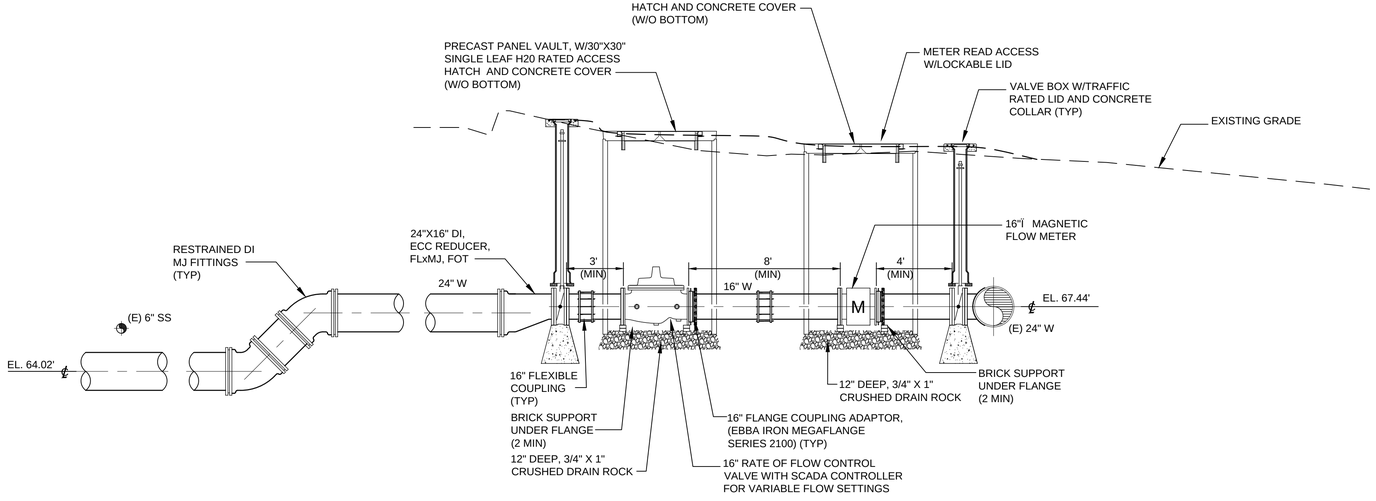
1"=4'-0"



TRANSITION COUPLING DETAIL 2 / C7

0 2 4

3/8"=1'-0"



CWD METER STATION SECTION A / C14

0 3 6

1/4"=1'-0"

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER RYAN S. YOUNG No. 81867 Exp. 12/31/15 CIVIL STATE OF CALIFORNIA

DESIGNED RSY

DRAWN LMM

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

CIVIL DETAIL I

90% SUBMITTAL

FILE NAME 147000200-C14

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET C14 OF 21

8/5/2014 4:03 PM MIKEMARX

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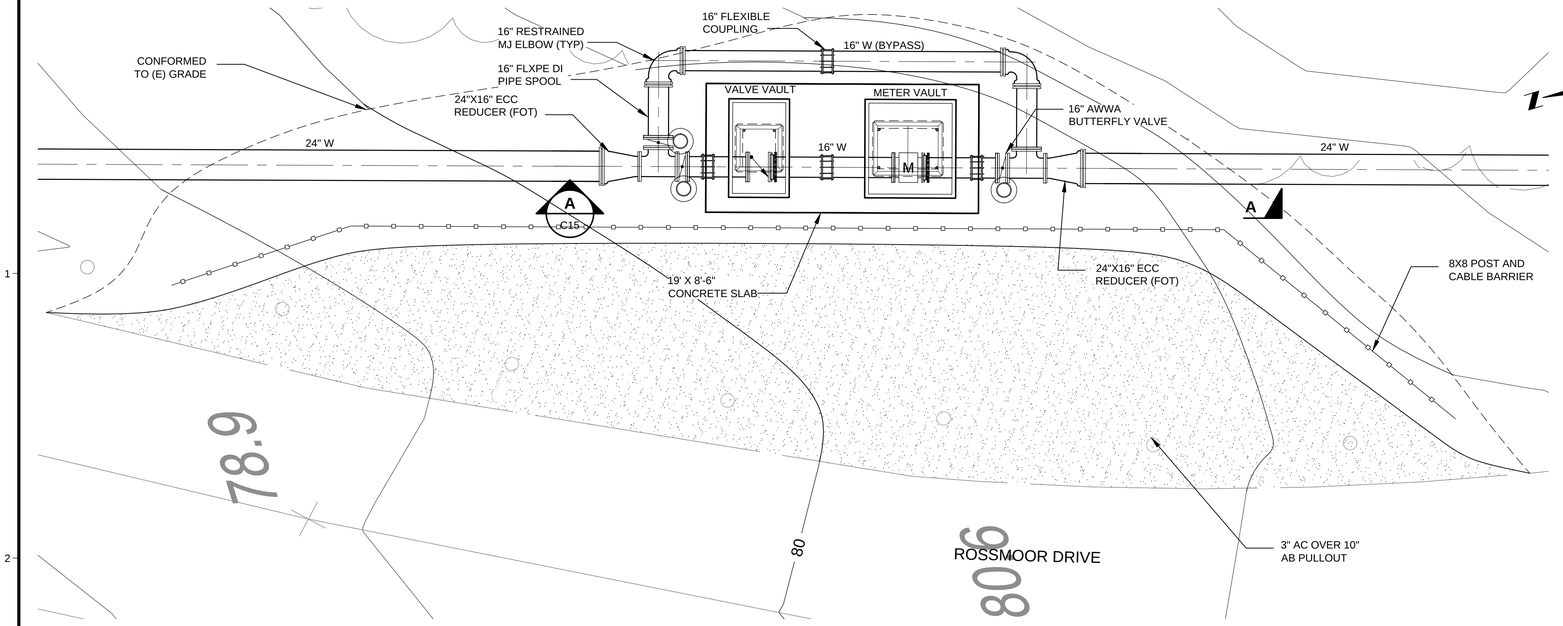
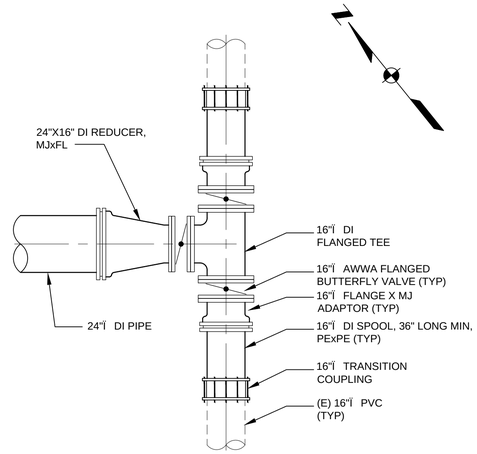


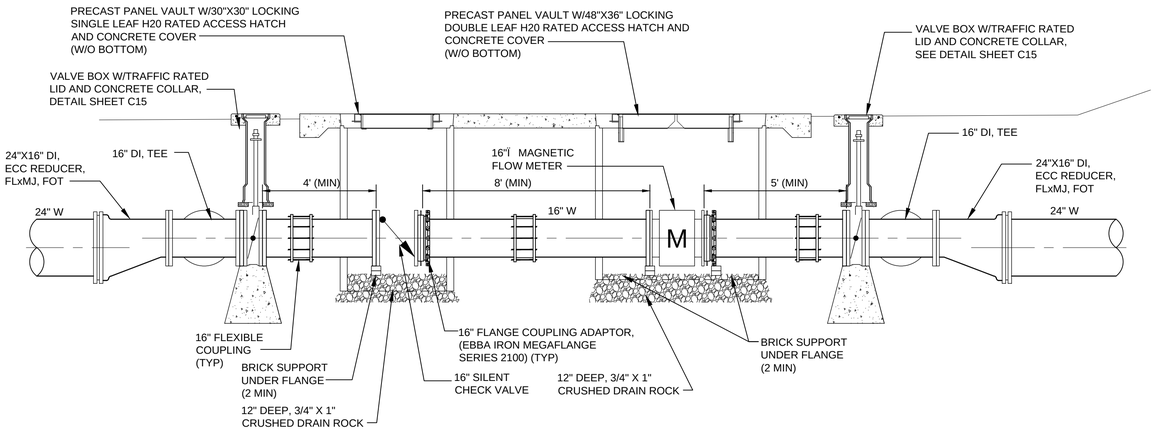
GSWC METER STATION DETAIL 3 / C11

0 5' 10'
1"=5'-0"



COLOMA TIE-IN 4 / C13

0 2 4
3/8"=1'-0"



GSWC METER STATION SECTION A / C15

0 2 4
3/8"=1'-0"

PRELIMINARY N.F.C.

NO.	REVISION	DATE	BY

SCALES
0 1"
0 25mm
IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER RYAN S. YOUNG No. 81867 Exp. 12/31/15 CIVIL STATE OF CALIFORNIA

DESIGNED RSY
DRAWN LMM
CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

CIVIL DETAILS II

90% SUBMITTAL

FILE NAME 147000200-C15
JOB NO. 1470002*00
DATE AUGUST 2014
SHEET C15 OF 21

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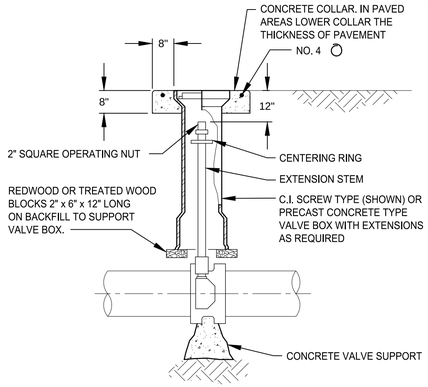
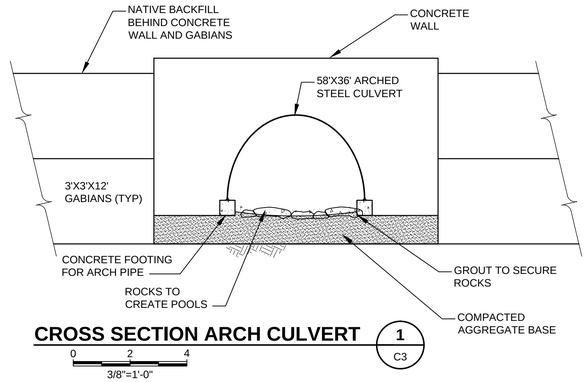


TYPICAL BURIED BUTTERFLY VALVE OPERATOR

SCALE: NONE

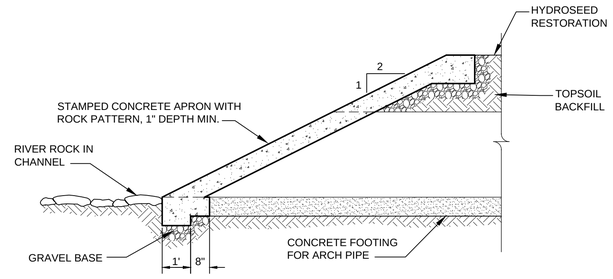


CROSS SECTION ARCH CULVERT 1

0 2 4

3/8"=1'-0"

C3

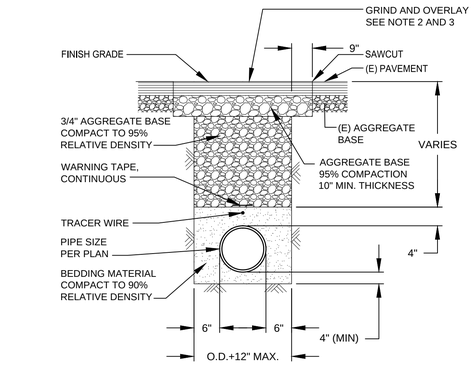


CONRETE INLET SLOPED WALL DETAIL 2

0 2 4

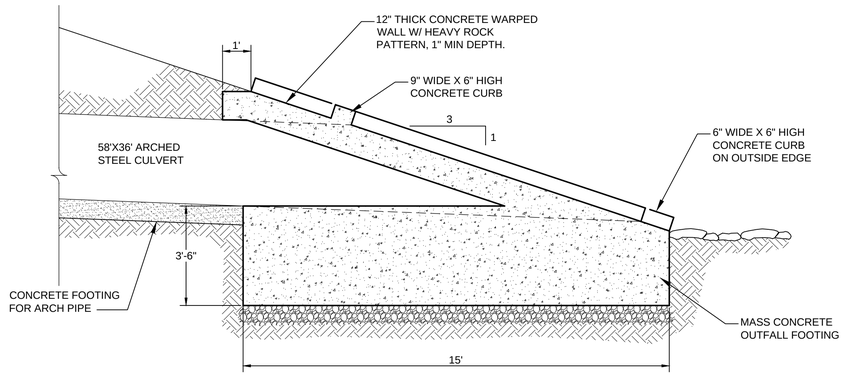
3/8"=1'-0"

C3



NOTES:

1. 3" TOTAL MINIMUM AC THICKNESS
2. GRIND AND PROVIDE OVERLAY FOR ENTIRE LANE WIDTH.
3. INSTALL OVERLAY IN TWO 2" LIFTS.

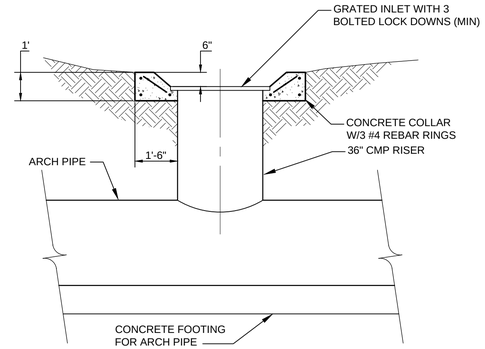


CONCRETE OUTLET WARPED WALL DETAIL 3

0 2 4

3/8"=1'-0"

C3



36" DROP INLET DETAIL 4

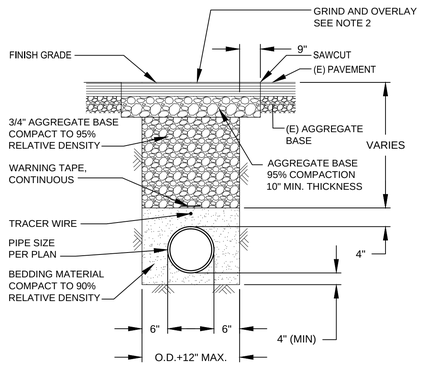
0 2 4

3/8"=1'-0"

C3

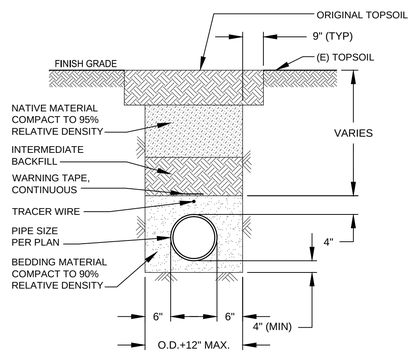
TYPICAL TRENCH SECTION THRU PAVED AREAS STA 58+60 TO 84+13.18

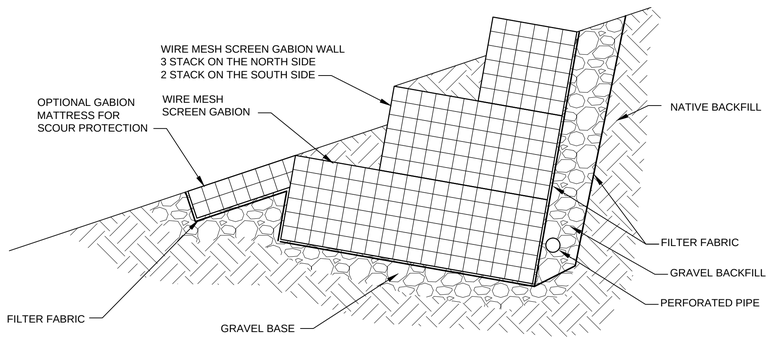
SCALE: NONE



NOTES:

1. 3" TOTAL MINIMUM AC THICKNESS
2. INSTALL OVERLAY IN OR43 IN TWO 2" LIFTS.





GABION WALL STACK DETAIL 5

0 2 4

3/8"=1'-0"

C3

TYPICAL TRENCH SECTION THRU PARKWAY STA 21+00 TO 58+60

SCALE: NONE

TYPICAL TRENCH SECTION THRU UN-IMPROVED AREAS

SCALE: NONE

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SCALES

0 1"

0 25mm

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REGISTERED PROFESSIONAL ENGINEER
RYAN S. YOUNG
No. 81867
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DESIGNED	RSY
DRAWN	LMM
CHECKED	ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

CIVIL DETAILS III

90% SUBMITTAL

FILE NAME	147000200-C16
JOB NO.	1470002*00
DATE	AUGUST 2014
SHEET	C16
OF	21

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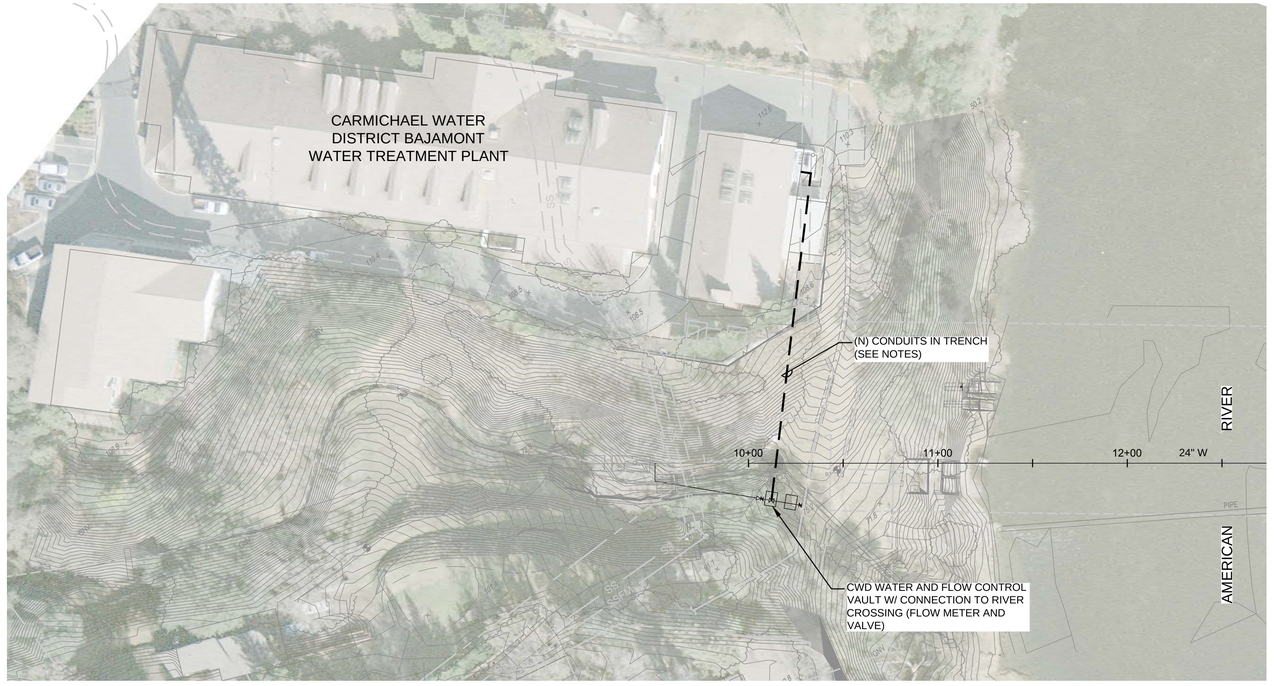

PLAN

0 20 40 60

1"=40'

ELECTRICAL, INSTRUMENTATION AND CONTROL SCOPE NOTES

1. ALL WORK SHALL BE INSTALLED PER NEC AND AS DESCRIBED IN THE TECHNICAL SPECIFICATIONS.
2. ELECTRICALLY INSTALL A FLOWMETER AS SHOWN ON THE DRAWINGS AND AS RECOMMENDED BY THE MANUFACTURER AT THE WATER TREATMENT PLANT. PROVIDE CONDUIT AND POWER CONDUCTORS BETWEEN THE EXISTING PANELBOARD AND THE NEW FLOWMETER. PROVIDE A 1-1/4 INCH CONDUIT AND TWO #16 TSP SIGNAL CONDUCTORS BETWEEN THE EXISTING PLC CONTROL PANEL AND THE NEW FLOWMETER
3. ELECTRICALLY INSTALL AN ELECTRONIC ACTUATED FLOW CONTROL VALVE AS SHOWN ON THE DRAWINGS AND AS RECOMMENDED BY THE MANUFACTURER AT THE WATER TREATMENT PLANT. PROVIDE CONDUIT AND CONTROL CONDUCTORS BETWEEN THE EXISTING PLC CONTROL PANEL AND THE NEW VALVE POSITION SWITCHES. PROVIDE A 1-1/4 INCH CONDUIT AND #16 TSP SIGNAL CONDUCTORS BETWEEN THE EXISTING PLC CONTROL PANEL AND THE NEW VALVE
4. REPROGRAM THE EXISTING LOCAL PLC AND REMOTE SCADA SYSTEM TO MONITOR FLOW AND VALVE POSITION AND PROVIDE A FLOW BASED SETPOINT CONTROL SIGNAL FOR THE VALVE. TOTALIZE FLOW AND INDICATE ABNORMAL CONDITIONS AS ALARMS IN A MANNER SIMILAR TO EXISTING SIMILAR SYSTEMS AT THE FACILITY. DOCUMENT ANY CHANGES MADE TO THE WIRING IN THE CONTROL PANEL
5. TEST ALL SYSTEMS TO THE SATISFACTION OF THE DISTRICT
6. ROUTE THE CONDUIT TO PANEL BOARD.

PRELIMINARY N.F.C.

NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

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REGISTERED PROFESSIONAL ENGINEER SAMUEL W. TICKNER No.14638 Exp.12-31-2014 ELECTRICAL STATE OF CALIFORNIA

DESIGNED RSY

DRAWN HCS

CHECKED ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL, CALIFORNIA

AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

ELECTRICAL SITE PLAN AND NOTES

90% SUBMITTAL

FILE NAME 147000200-E01

JOB NO. 1470002*00

DATE AUGUST 2014

SHEET **E1** OF 21

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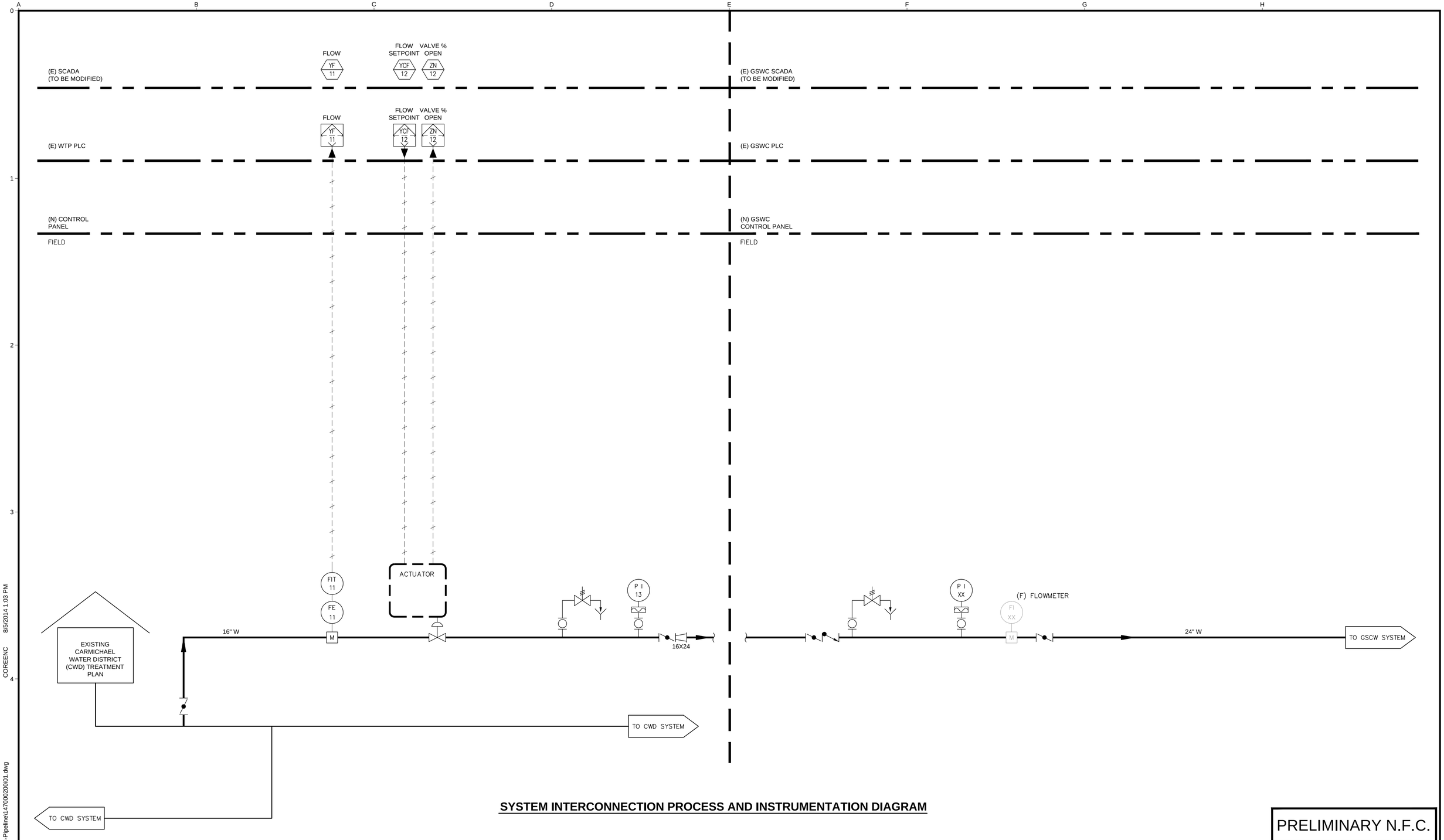

SYSTEM INTERCONNECTION PROCESS AND INSTRUMENTATION DIAGRAM

PRELIMINARY N.F.C.

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NO.	REVISION	DATE	BY

SCALES

0 1"

0 25mm

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REGISTERED PROFESSIONAL ENGINEER SAMUEL W. TERRY No.7125 Exp.06-30-2015 CONTROL SYSTEMS STATE OF CALIFORNIA

DESIGNED	SWT
DRAWN	CCE
CHECKED	ARP

CARMICHAEL WATER DISTRICT
CARMICHAEL CALIFORNIA
CWD-GSWC
PIPELINE CONVEYANCE PROJECT

Kennedy/Jenks Consultants
10850 GOLD CENTER DRIVE, SUITE 350, RANCHO CORDOVA, CA 95670

SYSSTEM INTERCONNECTION PROCESS AND INSTRUMENTATION DIAGRAM

FILE NAME	147000200I01
JOB NO.	1470002.00
DATE	APRIL 2014
SHEET	I1
OF	##

APPENDIX B

BIOLOGICAL ASSESSMENT

BIOLOGICAL ASSESSMENT

CARMICHAEL WATER DISTRICT
AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

FEBRUARY 2015

LEAD AGENCY:

Carmichael Water District
7837 Fair Oaks Boulevard
Carmichael, CA 95608
(916) 483-2452

BIOLOGICAL ASSESSMENT

CARMICHAEL WATER DISTRICT
AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

FEBRUARY 2015

LEAD AGENCY:

Carmichael Water District
7837 Fair Oaks Boulevard
Carmichael, CA 95608
(916) 483-2452

PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479
www.analyticalcorp.com

TABLE OF CONTENTS

BIOLOGICAL ASSESSMENT/ESSENTIAL FISHERY HABITAT ASSESSMENT
AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

On behalf of the Carmichael Water District (CWD or District), Analytical Environmental Services (AES) has prepared this Biological Assessment (BA) in accordance with guidelines established by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). This BA includes specific information on the following:

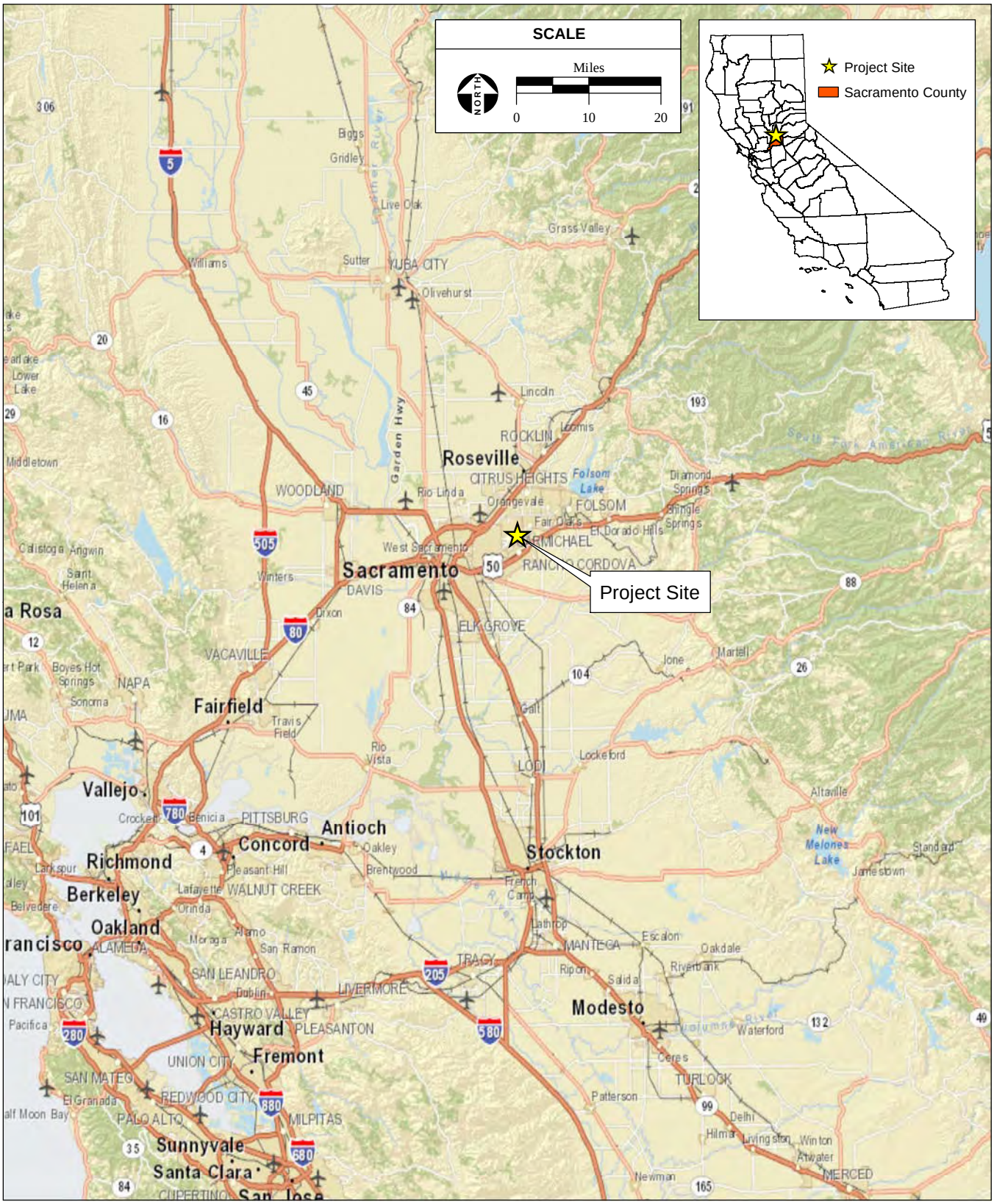
- Characterizes the habitat types present within the Action Area;
- Evaluates the potential for the occurrence of federally endangered, threatened, proposed, candidate, or species of special concern species within the Action Area;
- Special status plant surveys for all special status plants with the potential to occur within the project site;
- Surveys for special status wildlife and their respective habitat use in and around the proposed development areas;
- Utilizes the best scientific and commercial information available to assess the potential for the Proposed Project to adversely impact federally listed species and designated critical habitat; and
- Recommends mitigation measures designed to avoid or minimize project-related impacts.

1.1 PROJECT LOCATION

The project site is located in the community of Carmichael, Sacramento County (County), California on the north side of the American River, and the City of Rancho Cordova on the south side of the river (**Figure 1**). The project site is situated on Township 9 North, Range 6 East of the Carmichael and Citrus Heights, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles (quads). The centroid of the project site is approximately 38° 37' 31.13" North, 121° 18' 13.26" West. A topographic map and an aerial photograph of the project site are shown in **Figures 2** and **3**, respectively.

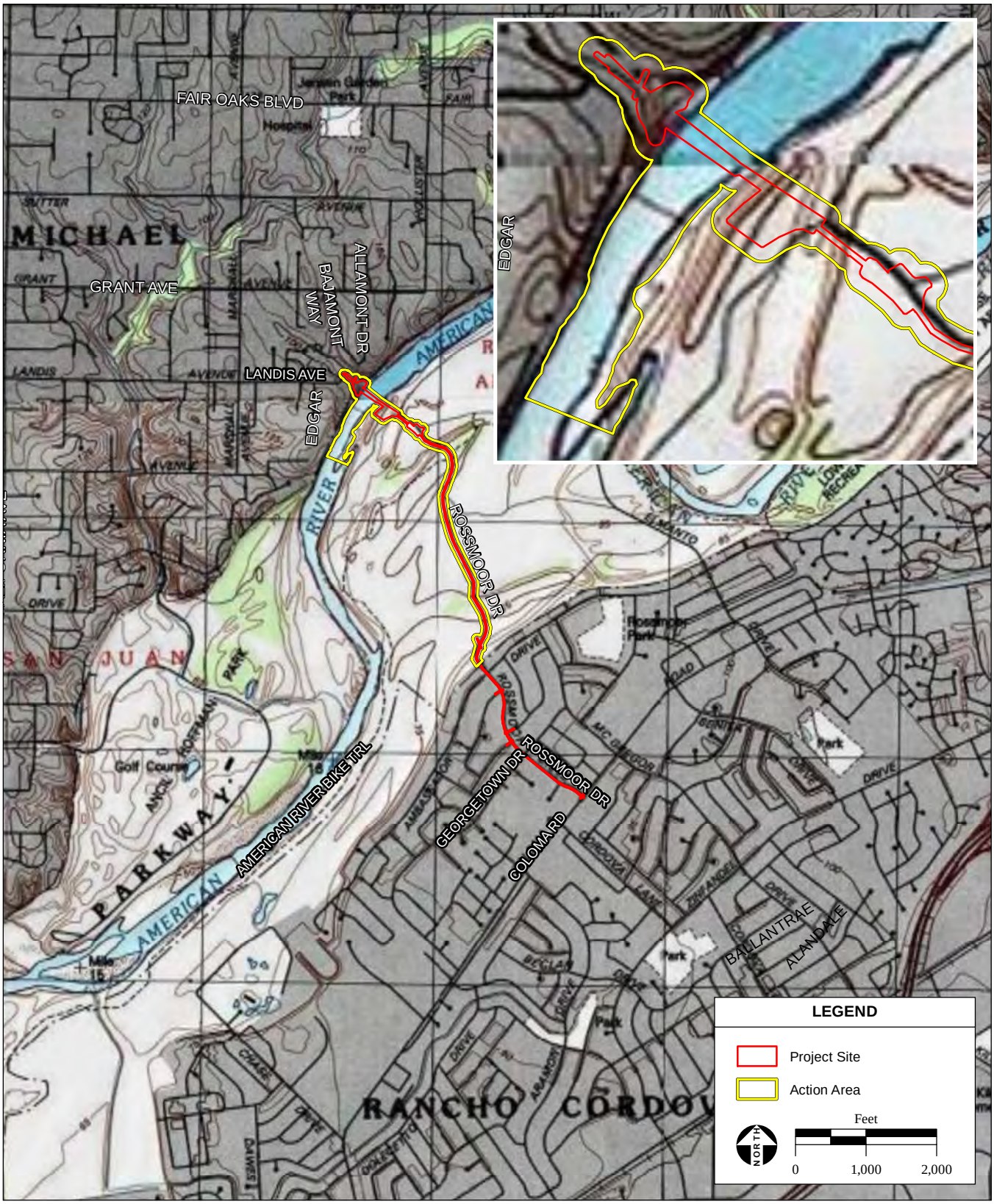
1.2 ACTION AREA

The Action Area is defined as "all areas to be affected directly or indirectly by the Federal [permitting] action and not merely the immediate area involved in the action." The 5.72-acre project site shown on **Figures 2** and **3** consists of the area to be directly impacted (which includes a 10 foot estimated buffer around the pipeline alignment within the American River), and all staging areas. The project site (designated in red on **Figure 2**) also continues down Rossmoor Drive, outside of the American River floodplain and American River Parkway, and outside of the "Action Area." The Action Area (22.28 acres in total) includes: the portions of the project site within federal jurisdiction; a 50 foot buffer from the outside edge of the project site; and the American River downstream of the project site to a point approximately 1,000 feet downstream from the proposed pipeline crossing. The rationale for the delineation of the downstream border of the Action Area is that the flow within the reach 1,000 feet downstream is of



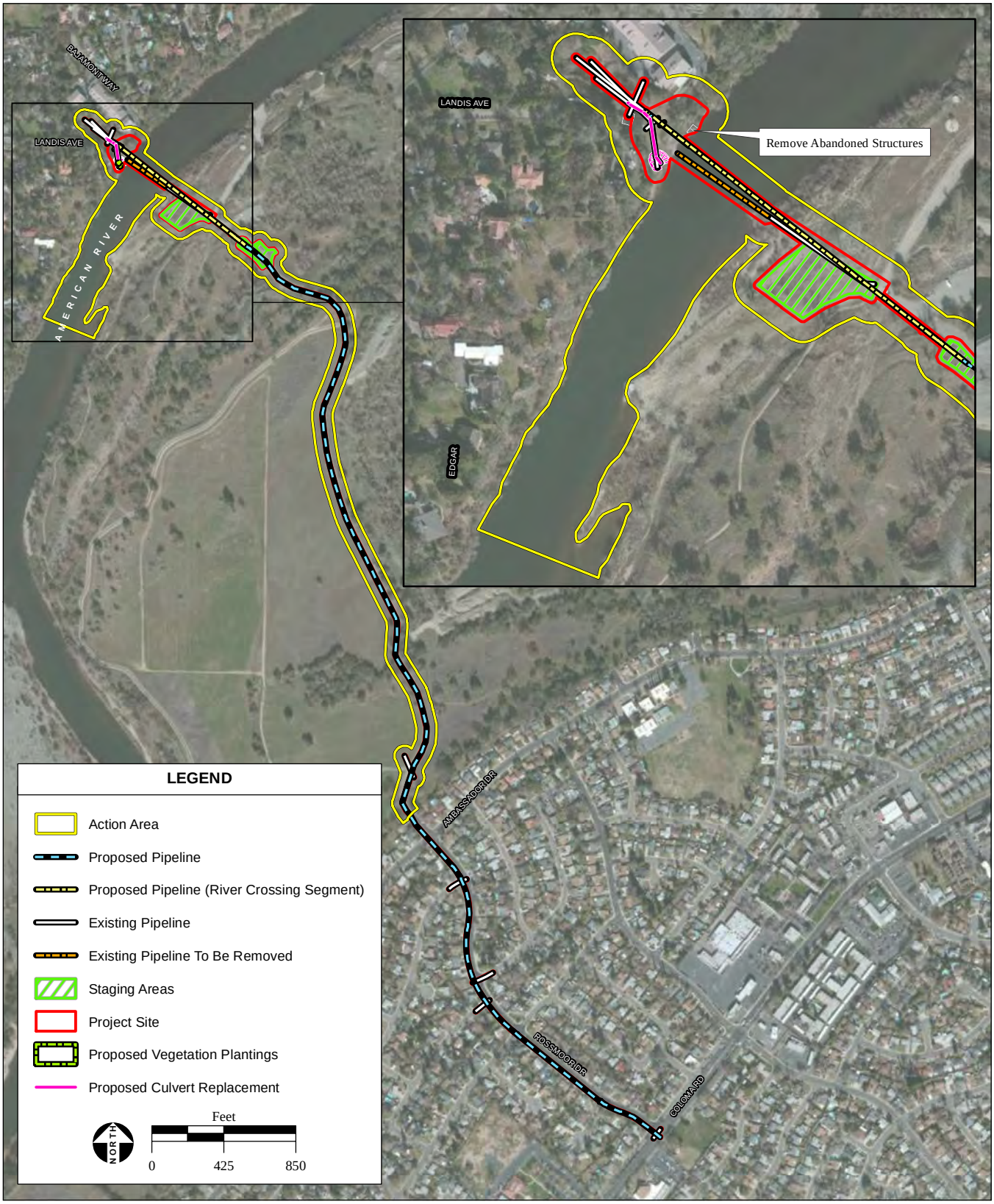
SOURCE: ESRI Data, 2014; AES, 2014

Figure 1
Regional Location



SOURCE: "Citus Heights, CA" & "Carmichael, CA" USGS 7.5 Minute Topographic Quadrtangles, T9N, R6E, Unsectioned Areas of Citrus Heights & Carmichael, Mt. Diablo Baseline & Meridian; AES, 2014

Figure 2
Site and Vicinity



SOURCE: Kennedy-Jenks, 8/2014; DigitalGlobe aerial photograph, 2/2/2012; AES, 2014

Figure 3
Aerial Photograph

relatively low velocity during the proposed period of project construction, and any fine sediments that potentially escape containment measures would likely settle out within the identified Action Area.

1.3 PROJECT BACKGROUND

Implementation of the Proposed Project would provide treated water to Golden State Water Company (GSWC) in the City of Rancho Cordova to replace groundwater affected by contamination. Aerojet will provide 5,000 acre-feet (af) of groundwater per year to GSWC, which has been identified as a water supply to replace wells shut down due to contamination.[1] Aerojet pumps the groundwater from its existing wellfields in Rancho Cordova and Fair Oaks, treats the water at an existing groundwater treatment plant (GWTP), and releases it into Buffalo Creek directly upstream of its confluence with the American River. The facilities, known as Groundwater Extraction and Treatment facilities, or GET facilities, operate under U.S. Environmental Protection Agency (USEPA) oversight and meet National Pollutant Discharge Elimination System (NPDES) treatment standards.[2] The American River is used to convey treated groundwater downstream. The State Water Resources Control Board (SWRCB), in a draft order, recognized that

> "[t]o the extent that the groundwater Aerojet pumps, treats, and discharges into the American River is not contributory to the surface stream, and would not be contributory under natural conditions, this water is foreign and developed because it would not have reached the stream otherwise and is imported by artificial means.
>
> A person or entity that by his or her own efforts makes such water available is entitled to use it, so long as the use does not infringe on the prior rights of others. Water Code section 7075 allows the use of a natural stream channel as a conduit for delivering water to another location downstream."[3]

This was later confirmed by SWRCB staff in a 2007 letter, which stated that

> [R]e-diversion of an equivalent amount of water to that which originated as percolating groundwater which, under natural conditions, would not reach or recharge the stream is considered foreign and developed water. A person or entity that by his or her own efforts makes such water available is entitled to use it, so long as the use does not infringe on the prior rights of

[1] Section 2.2.3.1 of the Master Settlement Agreement and Release entered between the American States Water Company and Southern California Water Company and Aerojet General Corporation and Cordova Chemical Company dated October 12, 2004.

[2] *See* Fact Sheet, NPDES Permit No. CA0083861 (Order R5-2014-0126) (Oct. 10, 2014), pp. F-4 to F-5.

[3] State Water Resources Control Board, Draft Order Denying Petition to Revise the Declaration of Fully Appropriated Streams to Allow Processing of Applications to Appropriate Treated Groundwater Discharged into the Lower American River, at *15 (May 12, 2003).

others. Water Code section 7075 allows the use of a natural stream channel as a conduit for delivering water to another location downstream.[4]

Aerojet has previously transferred a portion of this GET water to the County of Sacramento under a 2010 agreement, which transfer was recognized to be effective.[5] More recently, Aerojet temporarily transferred GET water to CWD to meet the District's need during 2014 drought conditions. CWD will collect the water on behalf of GSWC at its existing water intake facility (existing Ranney collectors on the south side of the American River) from which it is transported to the to the Bajamont Water Treatment Plant (WTP) facility on the north bluff above the river. There are two facilities housed within the Bajamont WTP building at this location; in addition to the District's Bajamont water treatment facility, Aerojet's Groundwater Extraction and Treatment LB (GET LB) is located on-site. Following treatment to SWRCB Division of Drinking Water standards at the Bajamont WTP, the treated water will then be transported through a proposed pipeline beneath the American River to existing GSWC infrastructure and provided to customers within the GSWC service area. The pipeline will also have the ability to convey water back from GSWC to CWD during severe drought conditions.

Because the new pipeline that will be constructed under the American River and will need to pass through an eroded river bank beside the existing Aerojet GET LB facility and Bajamont WTP outlet channel, improvements to the river bank will be necessary. In addition to erosion, the river bank contains old and abandoned water-related structures that must be removed to make room for the new pipeline. The Aerojet GET LB facility currently discharges treated water into the unnamed drainage that flows into the American River; this drainage begins upstream from the GET LB facility discharge point as a daylighted stream, then enters an existing undersized culvert that drops toward the American River. Significant undercutting has occurred where the culvert ends, which has created a drop of approximately 12 feet over a distance of 50 feet (24 percent slope) at the confluence of the drainage with the American River.

In addition, an existing water pipeline across the American River was installed in the 1950s to bring water from the District's Ranney collectors and delivering it for use within CWD. The existing pipeline was trenched below river grade at the time of initial construction. Over the years, natural scouring of the river bottom has gradually exposed the pipeline, creating a potential safety hazard for those using the river and presenting a liability for the District.

[4] Letter from Katherine Mrowka, Chief, Watershed Unit 3, to Joyce Horizumi, Sacramento County Water Agency (SCWA) (Mar. 13, 2007).

[5] Final Environmental Impact Report/Environmental Impact Statement, Vol. I, Ch. 3 (Rio del Oro Specific Plan Project, Master Responses), at 3-1 (June 24, 2010), available at http://www.cityofranchocordova.org/ftp/large_docs/Public%20FEIR-FEIS_Vol%20I.pdf.

1.4 PROJECT DESCRIPTION

The Proposed Project consists of: 1) new drinking water pipeline construction beneath the American River to connect the Bajamont WTP with the existing GSWC distribution system in Rancho Cordova; 2) old pipeline removal of the abandoned water collection pipeline that is partially exposed and buried in the bed and banks of the American River; 3) culvert replacement and bank stabilization at the unnamed drainage on the north bank of the American River adjacent to the WTP; and 4) stream restoration primarily along the north bank of the American River and related restoration of impacted areas on the south bank. The project components are shown on **Figure 3**.

PIPELINE CONSTRUCTION AND REMOVAL

The 300 feet of partially exposed 33-inch diameter abandoned pipeline within the American River and associated concrete and steel structures will be removed. A new 30-inch diameter pipeline will be installed from the Bajamont WTP on the north side of the river to an existing GSWC water main located along Coloma Road near Rossmoor Drive on the south side, as shown on **Figure 3**. The pipeline on the north side of the American River will tie into existing infrastructure at the Bajamont WTP. The pipeline will follow Rossmoor Drive and terminate at Coloma Road in Ranch Cordova where it will tie into an existing water main in the GSWC distribution system.

Approximately 1,060 feet of pipeline will be installed beneath the American River using horizontal directional drilling techniques to a depth of up to 85 feet. This portion of the pipeline, called the American River crossing segment, will be made of 30" diameter high density polyethylene (HDPE) pipe. The remaining pipeline alignment, which will follow Rossmoor Drive for 6,143 feet, will be a 24" diameter ductile iron (DI) pipe installed using open cut trenching with a depth of cover of approximately 5 feet. The increased pipeline diameter is to address the greater wall thickness of the HDPE pin and provide an equivalent capacity as the 24" diameter DI pipe. There are no official levees along the pipeline route.

CULVERT REPLACEMENT

The Aerojet GET LB facility (located within the same facility as the Bajamont WTP) currently discharges treated groundwater into an unnamed drainage that flows immediately adjacent to the District's Bajamont WTP to the American River. The unnamed drainage enters a 24-inch diameter culvert near it confluence with the American River; this existing culvert is undersized and cannot convey storm flows. Overtopping of the culvert occurs during winter storm events, and significant undercutting occurs at the outlet of the culvert where it falls approximately 8 to 10 feet as it approaches the normal low flow confluence with the American River. All of these conditions lead to erosion and channel scouring that puts public utilities (trenched pipelines, sewer lift station, and water pipelines) near the unnamed drainage at risk. As part of the Proposed Project, the existing culvert will be replaced with a bottomless 47-inch by 60-inch arched culvert. In order to protect existing facilities, the culvert will be approximately 150 feet long, extending

approximately 70 feet beyond the location of the existing undersized culvert. Lengthening the culvert also allows the slope of the culvert to be maintained at its current slope while still lowering the outfall near the American River to reduce the drop. The maintenance of the current slope in combination with the proposed pool drops will also increase habitat connectivity from the American River to the unnamed drainage. The bottomless culvert will be lined with a pre-fabricated modular stability system and will contain rocks and gravel to provide more natural habitat for wildlife. The bottomless culvert will be sized so that it can convey storm flows and the GET LB outflows without backing up and causing channel instability and incision.

Stair-stepping pools will be constructed that allow a gradual transition from the emergence of the new culvert to the low flow bank of the American River to remediate the steep undercutting that has occurred at the outlet of the unnamed drainage. The first pool, approximately 50 feet from the low flow confluence with the American River, will be the longest and the deepest at approximately 14 feet in diameter (at the widest point) by 18 inches deep, allowing water flowing out of the culvert to pond and dissipate energy, thereby reducing its erosion potential. Water will then flow into a series of smaller, shallower pools that are approximately 7 to 10 feet in diameter (at the widest point) by 10 to 12 inches deep. This design, which mimics natural river geomorphology, will also provide holding habitat for fish in the deeper (18 inch deep) pools, especially during receding water from higher flows on the American River. Erosion will be minimized through the use of construction materials such as large rocks and pre-fabricated articulated concrete blocks to prevent undercutting while still retaining characteristics of a more natural stream. The existing steeply incised banks will be partially stabilized and replanted with native vegetation to help prevent further erosion, restore habitat, and stabilize the existing unnamed drainage channel, even at high flows in the American River when the entire area may be partially or fully inundated.

STREAM RESTORATION

The general goals of the stream restoration are to: 1) increase stability of the eroding river bank by upgrading and resizing the existing culvert to a bottomless culvert within the unnamed drainage; 2) reduce instream water temperature by improving the multi-story shade and cover along the northern bank of the American River by removing or cutting back into the bank the existing abandoned WTP facilities which now extend into the American River; 3) replant native vegetation and increase wildlife habitat values along the northern and southern banks of the American River; and 4) discourage the growth of the invasive species such as English ivy, periwinkle, Italian lords and ladies, star thistle, and tree of heaven, which are now in the area and will be partially removed and replaced with native vegetation.

Restoration activities recommended for the north bank include the removal of the existing culvert, installation of a bottomless culvert, grading of the riverbank to reduce erosion, removing the abandoned steel and concrete utility pads along the American River bank, and replanting native vegetation.

There are two unused steel and concrete vaults on the north bank of the American River at the edge of the CWD property that create a steep drop-off and cliff down to the American River. These will be demolished and removed to below the bank elevation as part of the Proposed Project. The deep foundations of the existing structures will be abandoned in place to maintain bank stability and the bank will be re-contoured to a natural river bank at approximately a 3:1 slope. Following the replacement of the culvert in the unnamed drainage, invasive species along the lower banks of these impacted slopes will be removed and native vegetation will be replanted. The native shrubs and grass seed mix would provide habitat and bank stabilization benefits.

STAGING AREAS

As shown on **Figure 3**, there are three staging areas: one is located on the north bank near where the existing access road terminates into a relatively flat area near the existing unnamed drainage culvert, another is located on the south bank near the low flow shoreline from which the abandoned pipeline will be removed, and the final one is located further along Rossmoor Drive on the south bank about 500 feet up from the low flow bank where the horizontal drilling will begin for the new under-river pipeline. These two south bank staging areas are located within the American River Parkway, near a boat launch that provides public access for recreational boaters, fishermen, and cyclists from Rossmoor Drive.

2.0 ENVIRONMENTAL SETTING

The project site is bound by residential development, open space, park lands, and the American River. It ranges in elevation from approximately 53 feet above mean sea level (amsl) at the American River to 110 feet amsl along the north bank at the WTP.

2.1 EXISTING SITE CONDITIONS

NORTH BANK

The north bank project site consists of the length of the unnamed drainage, its confluence with the American River, and the banks of the American River adjacent to the outfall. The existing culvert in that unnamed drainage is approximately 80 feet long with an unprotected concrete headwall and wingwall at the upstream entrance. The discharge from the culvert has an approximately 8- to 10-foot freefall drop to the level of the low flow American River channel below. There is an existing eroded "U" shaped bank at the point of discharge, as well as active sloughing along the western leg of the "U" that appears to have been activated by high American River flows. In addition to the eroding culvert, there are two unused steel and concrete vaults on the north bank of the American River at the edge of the CWD property that create a steep drop-off and cliff down to the American River.

AMERICAN RIVER

Spanning the American River between the north and south banks is an abandoned 33-inch diameter water supply pipeline that is exposed along a portion of the river bottom. This pipeline enters the American River approximately 10 feet north of the culvert discussed previously and spans the entire width of the river (approximately 300 feet). The pipeline starts at a former water supply junction on the north bank and runs southeast along the river bottom, surfacing on the south side of the river where it formerly tied into the CWD Ranney collector system. The pipeline was originally buried approximately 8 feet below the bottom of the American River and was encased in concrete, but over time it has become exposed due to river scour. The steel-reinforced concrete encasement has since been damaged and pieces of the pipeline and encasement lie exposed, and at low flows this pipeline creates a potential safety hazard.

SOUTH BANK

The south bank project site is located adjacent to where the abandoned pipeline emerges. The habitat at this location encompasses the riparian willow scrub belt immediately along the American River margins and transitions up to the secondary floodplain where the site is poorly vegetated upland habitat. This entire area is underlain by historic-era mine tailings. Riparian restoration areas sponsored by other agencies (U.S. Army Corps of Engineers) are located further along Rossmoor Drive, outside of the Action Area. The river inundates the south bank at high flows during periods of controlled releases from Nimbus Dam and provides aquatic habitat at these flows for fish species. The south bank project site also includes the length of Rossmoor Drive until it intersects Coloma Road. The new water distribution pipeline will be trenched immediately along the existing road within the parkway and within Rossmoor Dr as it exists the Parkway until it intersects with the existing GSWC distribution system. This area is entirely within the immediate road shoulder and paved asphalt.

2.2 CLIMATE

Sacramento has a Mediterranean subtropical climate consisting of mild with moderate seasonality. The summer months are hot and dry while the winter months are cool and damp with frequent ground fog known regionally as "tule fog" which can obscure vision. Summer daytime temperatures approach 100 °F (38 °C), and occasional heat waves might bring temperatures exceeding 115 °F (46 °C). Vegetation has adapted to the dry summers, which makes it susceptible to fire.

2.3 SOILS

The project site has the following soil types: Americanos-Urban land complex, 0 to 2 percent slopes; Kasberg-Fiddyment-Urban land complex, 2 to 15 percent slopes; Rossmoor fine sandy loam, 0 to 2 percent slopes; Xerofluvents, 0 to 2 percent slopes, flooded; Xerolls, 30 to 70 percent slopes; and Xerorthents, dredge tailings, 2 to 50 percent slopes (NRCS, 2014). The Americanos-Urban land complex has a moderate infiltration rate when thoroughly wet; it moderately drains well; and has a moderate water

transmission rate. There is a slight erosion potential for the Americanos-Urban land complex. The Kasberg-Fiddyment-Urban land complex has a very slow infiltration rate with high runoff potential when thoroughly wet and a very slow water transmission rate. There is a slight erosion potential for the Kasberg-Fiddyment-Urban land complex. The Rossmoor fine sandy loam has a high infiltration rate with a low runoff potential when thoroughly wet; it is well drained to excessively well drained due to sands or gravelly sand; and a high water transmission rate. There is no hydrologic or erosion potential data available for Xerofluvents or Xerolls. Finally, Xerorthents, dredge tailings is composed of mine tailings with a high infiltration rate with a low runoff potential when thoroughly wet; it is well drained to excessively well drained due to sands or gravelly sand; and a high water transmission rate (NRCS, 2014).

3.0 METHODOLOGY

3.1 SPECIAL-STATUS SPECIES RECORDS SEARCH

Information for the project site has been obtained and reviewed from the following sources:

- Aerial photographs of the project site;
- USGS "Carmichael, CA" and "Citrus Heights, CA" 7.5-minute quads;
- A USFWS list of federally listed special-status species with potential to occur within the "Carmichael, CA" and "Citrus Heights, CA" 7.5-minute quads and within Sacramento County (USFWS, 2014b);
- A California Natural Diversity Database (CNDDB) list of State and federally listed special-status species with potential to occur within the "Carmichael, CA" and "Citrus Heights, CA" 7.5-minute quads and the surrounding quads (Rio Linda, Folsom, Sacramento East, Buffalo Creek, Florin, Elk Grove, and Sloughhouse);
- A CNDDB map of State and federally listed special-status species that have been documented within a five-mile radius of the project site (CDFW, 2014b); and
- A California Native Plant Society (CNPS) list of special-status plant species with potential to occur within the "Carmichael, CA" and "Citrus Heights, CA" 7.5-minute quads and the surrounding quads (CNPS, 2014).

The USFWS, CNDDB, and CNPS lists are provided in **Appendix D**.

Special status species surveys of the Action Area targeted those plant and wildlife species that were identified as having the potential to occur, or that have been recorded within a 5-mile radius or in specified habitat types within the Action Area. Those species were identified based on records obtained from the CNDDB, CNPS, and USFWS. Based upon the results of the biological surveys conducted on August 14 and October 1, 2014 and the review of regionally occurring special-status species and their habitat requirements, the Action Area has the potential to support federal and State listed special-status

species. The name, regulatory status, habitat requirements, and period of identification for these potentially occurring special-status species are identified in **Appendix A**. Federal special-species determined to have no potential to occur in the Action Area are not discussed further in this BA (refer to **Appendix A**). State special-status species are not discussed in this BA.

3.2 BIOLOGICAL FIELD SURVEYS

AES senior biologist/botanist Mark Hopkins conducted a reconnaissance level survey of the Action Area on August 14 and October 1, 2014. There was also a previous site visit completed on December 16, 2010 by AES aquatic biologist Benjamin Barker and botanist Laura Burris, in addition to CWD personnel and Kennedy Jenks, the project engineers. The site visits consisted of documenting representative plant species within terrestrial and aquatic habitat types and evaluating whether regionally occurring special-status species have the potential to occur within those habitat types. In addition, aquatic habitat types were identified to determine whether they would be potentially subject to the U.S. Army Corps of Engineers (USACE) jurisdiction.

The habitat types were classified using the *Manual of California Vegetation, Second Edition* (MCV; Sawyer et al., 2009) and were modified based on existing habitat conditions within the study area. Aquatic habitats within the study area were identified based on the wetland features mapped on the National Wetland Inventory (NWI) map (USFWS, 2014a) and field identification using criteria defined in the *1987 Wetland Delineation Manual* by the USACE and the *Regional Supplement for the Corps of Engineers Wetland Delineation Manual: Arid West Region* (*Version 2.0*) (USACE, 2008).

3.3 POTENTIAL EFFECT DETERMINATIONS

Five possible determinations exist regarding a Proposed Action's effects on protected fish and terrestrial species under the Federal Engendered Species Act (FESA). These determinations are as follows:

1. **No effect** - "No effect" is the appropriate conclusion when it is determined that the Proposed Action would not affect a listed species or designated critical habitat
2. **May effect, but is not likely to adversely affect** - "May affect, but is not likely to adversely affect" is the appropriate finding when effects on FESA protected species are expected to be discountable, insignificant, or completely beneficial. "Insignificant effects relate to the size of the impact, and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur (USFWS and NMFS, 1998)."
3. **May affect and is likely to adversely affect** - "May affect and is likely to adversely affect" is the appropriate finding if any adverse effect to listed species may occur as a direct or indirect result of the Proposed Action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. In fact, in the event the overall effect of the Proposed

Action is beneficial to an FESA-protected species, but also is likely to cause some adverse effects, then the Proposed Action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the Proposed Action, an "is likely to adversely affect" determination should be made (USFWS and NMFS,1998).

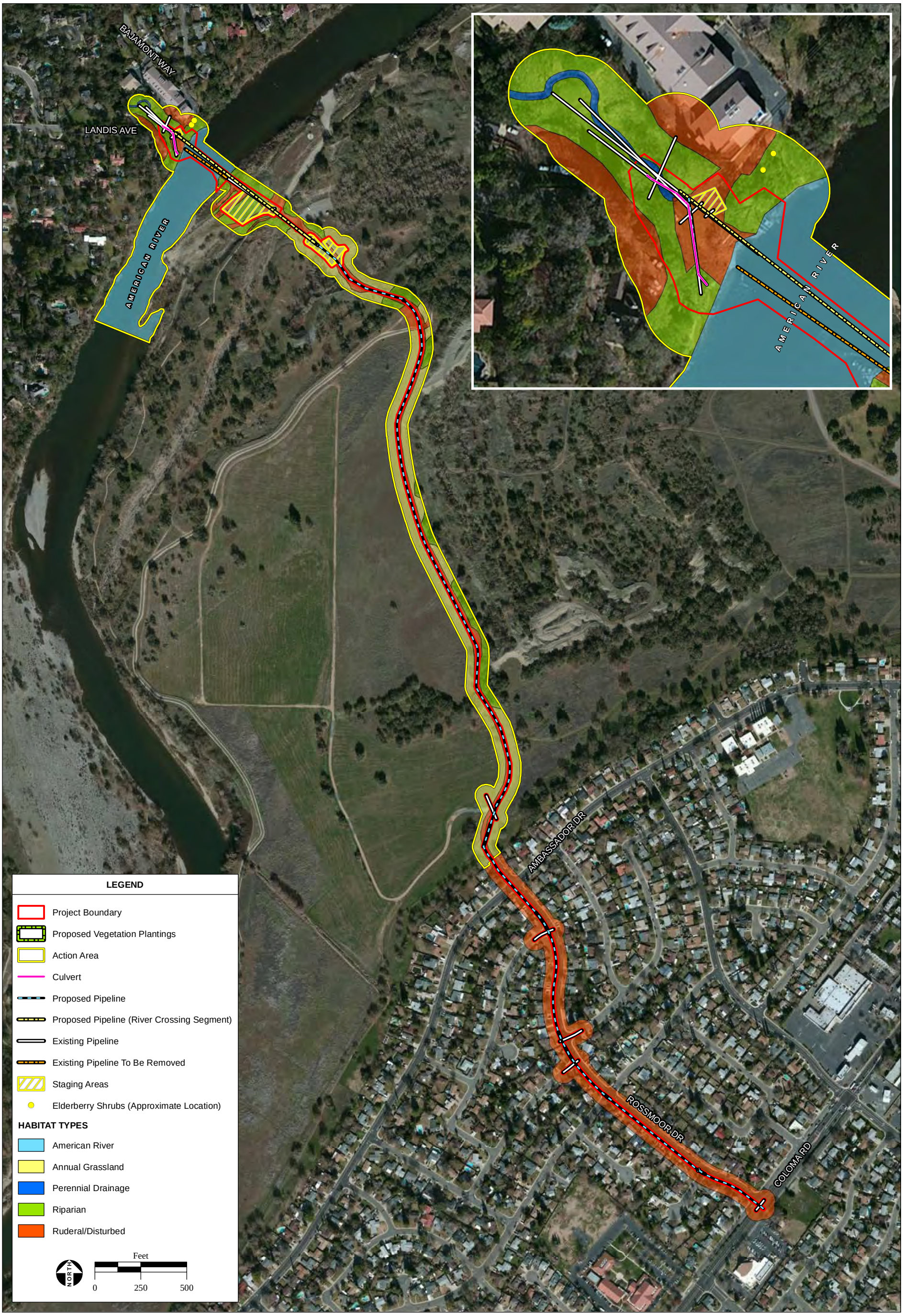
4. **Is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat** - "May affect, and is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat" is the appropriate determination when the action agency or the USFWS and/or NMFS identify situations where the Proposed Action is likely to jeopardize the species or adversely modify critical habitat. Jeopardy occurs when a Proposed Action is likely to directly or indirectly appreciably reduce the likelihood of both the survival and recovery of a protected species in the wild by reducing their reproduction, numbers, or distribution. Destruction or adverse modification of critical habitat is a direct or indirect alteration that appreciably diminishes the value of critical habitat for the survival or recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical (USFWS and NMFS, 1998).
5. **Is likely to jeopardize a proposed species or adversely modify proposed critical habitat**- "Is likely to jeopardize a proposed species or adversely modify proposed critical habitat" is the appropriate conclusion if the Proposed Action is likely to jeopardize the continued existence of the proposed species or adversely modify the proposed critical habitat.

The potential impacts of the Proposed Project on the species discussed in **Section 5.0** will be analyzed using these potential effects determinations.

4.0 HABITAT TYPES

The Action Area contains a variety of terrestrial and aquatic habitat types. Terrestrial habitat types identified within the Action Area include: ruderal/developed, annual grassland, and riparian. Aquatic habitats within the Action Area include: a perennial drainage (the unnamed drainage on the north bank) and the American River. No additional aquatic habitat was identified on the south bank below the ordinary high water mark (OHWM) of the American River, largely due to relatively quick-draining mine tailings present there. A habitat map of the project site and Action Area is presented as **Figure 4**.

As discussed in **Section 1.2** and shown in **Figures 2** and **3**, the project site refers to the construction area, while the Action Area refers to the area within federal jurisdiction for permitting purposes. Therefore, the acreage of habitats in the project site versus the Action Area are broken down in **Table 1**.



SOURCE: Kennedy-Jenks, 8/2014; DigitalGlobe aerial photograph, 2/2/2012; AES, 2014

Figure 4
Habitat Types

TABLE 1
HABITAT TYPES IN THE PROJECT SITE AND ACTION AREA

Habitat Type	Project Site	Action Area
Terrestrial Habitats		
Ruderal/Disturbed	3.71	4.59
Annual Grassland	0.67	7.46
Riparian	0.87	3.98
Subtotal	*5.25*	*16.03*
Aquatic Habitats		
American River	0.45	6.17
Perennial Drainage	0.02	0.08
Subtotal	*0.47*	*6.25*
TOTAL	**5.72**	**22.28**

4.1 TERRESTRIAL HABITATS

RUDERAL/DISTURBED

Approximately 4.59 acres of the Action Area is comprised of ruderal/disturbed or developed areas, which includes the existing Bajamont WTP and associated facilities and a pump station along the unnamed drainage on the north bank, and paved and gravel roads on the south bank. The project site includes some additional acreage of ruderal/disturbed habitat along the length of Rossmoor Drive outside of the American River Parkway. This habitat type comprises mostly of nonnative weedy plant species and ornamental trees. Dominant vegetation observed within the ruderal/disturbed areas includes ornamental tree species such as coast redwood (*Sequoia sempervirens*), incense cedar (*Calocedrus decurens*), tree of heaven (*Ailanthus altissima*), fig (*Ficus* spp.), and olive (*Olea* spp.). The ruderal/disturbed area is shown in **Figure 5a: Photos 1 and 2**.

ANNUAL GRASSLAND

In California, the term 'annual grasslands' represents an area where groups of non-native plant species (primarily annual grasses) have replaced native plant communities. These areas are now dominated by non-native annual grasslands. The annual grasslands within the Action Area occur primarily along Rossmoor Drive as it passes through the American River Parkway. There are 7.46 acres of this habitat type within the Action Area, predominantly along the length of pipeline within the American River Parkway; there are 0.67 acres of annual grassland within the project site (**Figure 5a: Photos 1 and 2**). Dominant vegetation observed within the annual grassland includes wild oat (*Avena* spp.), Italian ryegrass (*Lolium multiflorum*), clover (*Trifolium* spp.), barley (*Hordeum murinum*), turkey mullein (*Eremocarpus setigerus*), filaree (*Erodium* spp.), and black mustard (*Brassica nigra*).

PHOTO 1 Looking from Rossmoor Drive in a southwesterly direction at ruderal/disturbed (road and shoulders) and annual grassland habitat (open land to the left in the photo).

PHOTO 3: Looking north at the north bank. The photo shows the areas that will have the two unused steel and concrete vaults and bank restoration.

PHOTO 5: Looking north on the north bank at the intake to the culvert for the perennial drainage.

PHOTO 2: Looking north from the ruderal/disturbed habitat. Areas on the east and west are areas being considered for staging areas.

PHOTO 4: Looking south from the north bank at the American River and the south bank of the project site. The photo was taken overlooking the area were the pipe will be removed.

SOURCE: AES, 2014

Figure 5a
Site Photographs

RIPARIAN

The riparian corridor follows the low flow banks of the American River, which bisects the Action Area from the northeast to southwest. There are 3.12 acres of riparian habitat within the Action Area, both along the north and south bank of the American River (**Figure 5a: Photo 3**). The project site includes 0.87acres of riparian habitat.

On the northern bank adjacent to the unnamed perennial drainage, common vegetation observed in the overstory includes white alder (*Alnus rhombifolia*), Fremont cottonwood (*Populus fremontii*), willow (*Salix* spp.), tree of heaven, and live oak (*Quercus wislezenii*). The understory consists of California buckeye (*Aesculus californica*) and several non-native ground cover species including English ivy (*Hedera helix*), Italian lords and ladies (*Arum italicum*), and periwinkle (*Vinca* spp.). As shown on **Figure 4**, there are two elderberry bushes (*Sambucus mexicanus*) in the understory southeast of the Bajmount WTP; these shrubs are within the Action Area but are not within the construction footprint along the existing access road. The existing culvert proposed for replacement is underneath a planted grass area located on property adjacent to the CWD property; the property owner currently uses this turf area as a patio and recreation area (**Figure 5b: Photo 7**). CWD retains an easement.

In the immediate vicinity of the low flow channel along the south bank of the American River, the overstory vegetation consists mainly of sandbar willow (*Salix exigua*), Fremont cottonwood, Oregon ash (*Fraxinus latifolia*), tree of heaven, and valley oak (*Quercus lobata*).

4.2 AQUATIC HABITATS

The only wetland feature mapped within the Action Area on the National Wetlands Inventory is the riverine wetland type of the American River (USFWS, 2014a). The unnamed drainage and the American River are the only waters of the State and waters of the U.S. that occur within the Action Area, and would therefore fall under the jurisdiction of the USACE. These aquatic habitats would also likely fall under California Department of Fish and Wildlife (CDFW) and Regional Water Quality Control Board (RWQCB) jurisdiction as waters of the State. The American River bottom is also under the jurisdiction of the California State Lands Commission (CSLC).

AMERICAN RIVER

The American River bisects the Action Area from the northeast to the southwest (**Figure 5a: Photo 4**). The river at this location is approximately 250 to 300 feet wide. Flows in the American River within the Action Area are controlled by water release from Folsom Dam. Prior to the construction of Nimbus Dam (the reregulating reservoir for Folsom Dam) and the related CDFW fish hatchery located on the south bank at its base, peak flows typically occurred in late spring and during peak snowmelt runoff. Peak flows now usually occur in late winter through early spring, and are associated with flood control releases. The reach of the American River within the Action Area consists of mostly run and glide flow

PHOTO 6: Looking south at the outflow of the perennial drainage into the American River.

PHOTO 8: Looking south at the outflow of the perennial drainage into the American River.

PHOTO 10: Looking at the culvert on the north bank where it drops discharge into a plunge pool before flowing into the American River.

PHOTO 7: Looking north on the north bank at the intake to the culvert for the perennial drainage.

PHOTO 9: Looking at unnamed drainage on the north bank of the American River where it enters culvert.

SOURCE: AES, 2014

Figure 5b
Site Photographs

habitats at flows between 500 and 2,000 cfs. There are 6.17 acres of the American River within the Action Area.

As shown in **Figure 6**, the American River is designated critical habitat for Central Valley steelhead and essential fish habitat (EFH) for all federally-listed salmonids under the Magnuson-Stevens Fishery Conservation and Management Act (MSFA). EFH for fall/late-fall run Chinook occurs within the Action Area and is classified as a migratory corridor providing passage, spawning, and rearing habitat. The reach of the river within the Action Area is classified as "accessible" by CDFW in its Calfish BIOS passage database (CDFW, 2014a).

PERENNIAL DRAINAGE

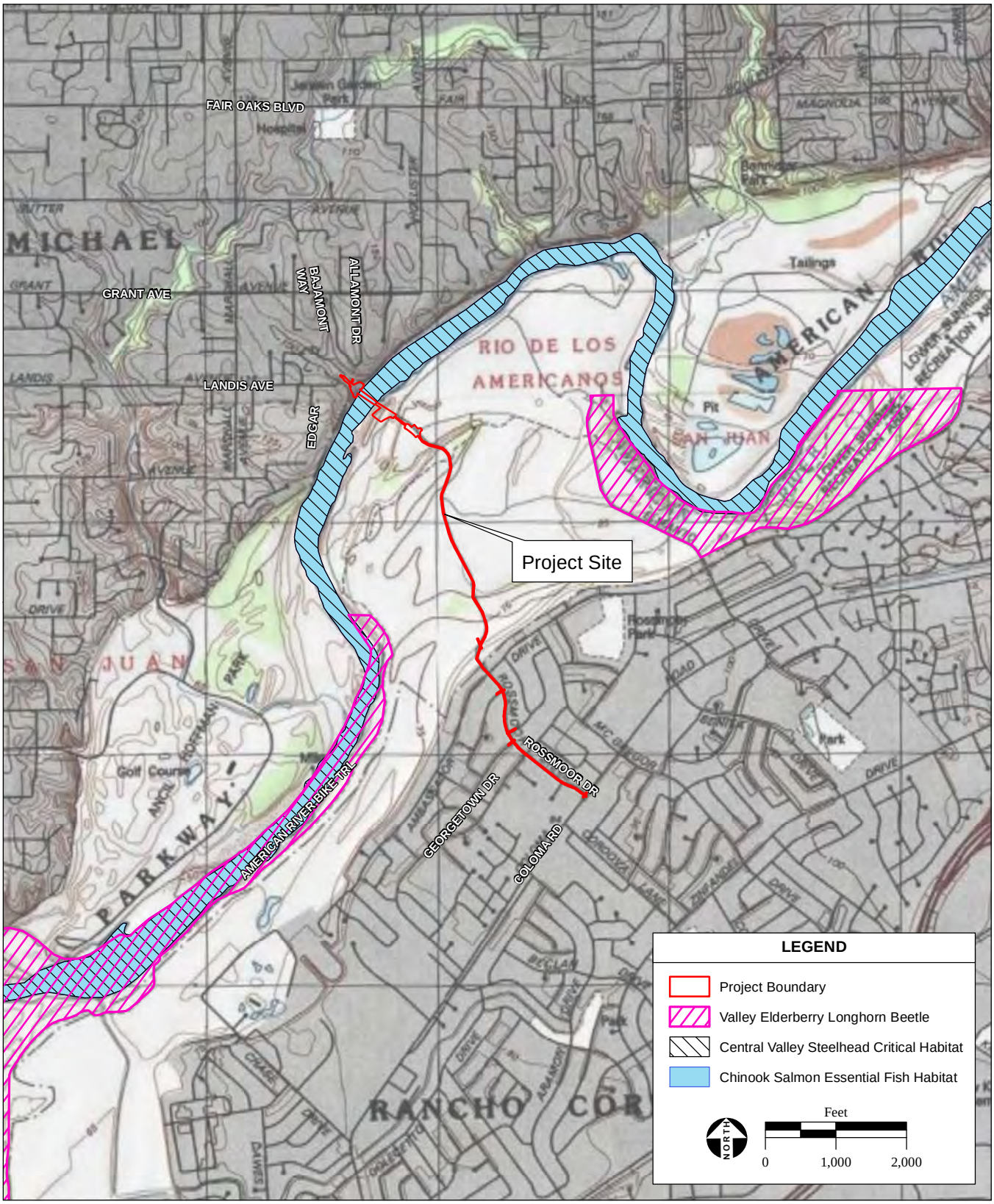
The unnamed perennial drainage ranges from approximately two to four feet in width and flows northwest to southeast within the northwestern portion of the Action Area (**Figure 5b: Photos 6** through **10**). This drainage is currently partially conveyed through the undersized culvert that is proposed for replacement as part of the project. This existing culvert is approximately 80 feet long and is buried approximately 6 to 8 feet deep. The drainage channel is dominated by coarse gravels, intermixed with deposits of sand. This unnamed drainage is largely ephemeral until it passes the Aerojet GET LB facility, where it receives a constant permitted discharge of 600 gallons per minute, resulting in a perennial flow of water being discharged through the culvert into the American River. This discharge was observed during the survey. There are 0.08 acres of perennial drainage within the Action Area.

5.0 SPECIAL-STATUS SPECIES

The review of federal special-status plants included in **Appendix A,** in addition to the three site visits conducted, determined that no federal special-status plants were likely to occur in the Action Area. Therefore, no special-status plant species are discussed further in this BA.

Potential habitat for four federal special-status wildlife species is located within the Action Area (**Appendix A**). For FESA compliance, the two fish species are under the jurisdiction of NMFS, and the two terrestrial species are under the jurisdiction of USFWS. These species are:

- Central Valley steelhead (*Oncorhynchus mykiss*)
- Central Valley fall/late-fall run Chinook salmon (*Oncorhynchus tshawytscha*)
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)
- Yellow-billed cuckoo (*Coccyzus americanus occidentalis*)



SOURCE: USFWS Critical Habitat Surveys of Sacramento County, 1980; "Citus Heights, CA" & "Carmichael, CA" USGS 7.5 MinuteTopographic Quadrtangles, T9N, R6E, Unsectioned Areas of Citrus Heights & Carmichael, Mt. Diablo Baseline & Meridian; AES, 2014

Figure 6
Critical Habitats

5.1 CENTRAL VALLEY STEELHEAD (*ONCORHYNCHUS MYKISS*) DISTINCT POPULATION SEGMENT (DPS)

Federal Status – Threatened
State Status – None

The Central Valley steelhead distinct population segment (DPS) was originally listed as threatened on March 19, 1998 (60 FR 13347) and again on January 5, 2006 (71 FR 834). The range of this DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin Rivers and their tributaries. The range includes portions of Amador, Alameda, Butte, Calaveras, Contra Costa, Colusa, Glenn, Mariposa, Merced, Nevada, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tuolumne, Yolo, and Yuba counties (CDFW, 2014b).

Adult Central Valley steelhead begin their migration from the ocean in the late fall through early winter and typically arrive at their spawning grounds between December and April, spawning shortly after arrival. Unlike other Pacific Coast salmonid species, not all Central Valley steelhead die after spawning, and some individuals may spawn two or more times (Moyle, 2002). Spawning takes place in relatively shallow water, typically glides shallow runs at depths ranging from 8 to 39 inches. Preferred spawning substrate is gravel ranging from 0.12 to 3.9 inches diameter. The optimum temperature for egg development is 9 to 11 °C (48 to 52 °F). After emergence, fry seek shallow edge water habitat for several months after which they disperse into suitable mid-channel habitat. Optimum juvenile growth and survival occurs at temperatures ranging from 13 to 17 °C (55 to 64 °F) with dissolved oxygen (DO) levels greater than 9 milligrams per liter (mg/L). Juveniles remain in the freshwater environment for one to two years where they forage mainly on aquatic invertebrates prior to migrating to the Pacific Ocean. They typically spend one to three years in near shore saltwater habitat foraging on crustaceans, small fish, and squid before reaching maturity and returning to their natal streams to spawn (Moyle, 2002; McEwan and Jackson, 1996).

Table 2 presents the life history of Central Valley steelhead within the American River. As shown in **Table 2**, adult migration occurs from November through April, with peak migration occurring from December through March. Spawning occurs from December through April. Juvenile rearing occurs throughout the year. Other life stage uses are shown in **Table 2**. The months of July through October have the fewest occurrences of this species in the American River.

TABLE 2
CENTRAL VALLEY STEELHEAD LIFE STAGE USE BY MONTH, AMERICAN RIVER

Life Stage	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Adult Migration	X	X	X	x							x	X
Spawning	X	X	X	X								X
Incubation/Emergence	X	X	X	X	X	x						x
Juvenile Rearing	X	X	X	X	X	X	X	X	X	X	X	X
Juvenile Emigration		X	X	X	X	x					x	x

X – Peak Occurrence; x – Life Stage Present
Source: McEwan and Jackson 1996, SWRI 2001

CENTRAL VALLEY STEELHEAD CRITICAL HABITAT

Critical habitat for the Central Valley steelhead was designated on September 2, 2005 (70 Federal Register 52488 – 52627). Critical habitat for Central Valley steelhead consists of estuarine waters of San Francisco Bay, the Sacramento-San Joaquin Delta, the Sacramento and San Joaquin rivers, and all tributaries to the Sacramento and San Joaquin river systems downstream of impassable barriers in the following counties: Tehama, Butte, Glenn, Shasta, Yolo, Sacramento, Solano, Yuba, Sutter, Placer, Calaveras, San Joaquin, Stanislaus, Tuolumne, Merced, Alameda, Contra Costa. Critical habitat for Central Valley steelhead is depicted in **Figure 6**. The nearest critical habitat is the American River, located within the Action Area. No EFH has been designated for Central Valley steelhead at this time. Critical habitat for Central Valley Steelhead contains the following primary constituent elements (PCEs):

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;
(2) Freshwater rearing sites with:
    (i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
    (ii) Water quality and forage supporting juvenile development; and
    (iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
(3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.
(4) Estuarine areas free of obstruction and excessive predation with:

(i) Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater;
(ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and
(iii) Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

ENVIRONMENTAL BASELINE FOR CENTRAL VALLEY STEELHEAD

PRESENT AND HISTORICAL DISTRIBUTION

The present distribution of steelhead in the Central Valley has been greatly reduced from its historical range, mostly due to construction of impassable dams that block access to essential spawning and rearing habitat. Historically, Central Valley steelhead spawned in the upper reaches of the mainstem Sacramento American, Feather, Yuba, Pit, McCloud rivers in the Sacramento basin; and the San Joaquin, Stanislaus, Merced, Tuolumne, Calaveras, Cosumnes, and Kings rivers in the San Joaquin basin; and in the lower reaches of numerous smaller tributaries to the these rivers. The California Advisory Committee on Salmon and Steelhead Trout (CACSST 1988) estimated that there has been a 95 percent reduction in spawning habitat for Central Valley anadromous fish. Yoshiyama and others (1998) estimated that 82 percent of Chinook salmon spawning and rearing habitat in the Central Valley has been lost, and they state that the percentage of lost habitat for steelhead is undoubtedly higher because steelhead typically ascended further than Chinook salmon to reach suitable spawning and rearing habitat.

The construction of Nimbus Dam in 1955 blocked nearly all historical spawning habitat for Central Valley steelhead in the American River system. Central Valley steelhead spawning habitat in the American River now consists of an 18 mile reach from approximately one mile upstream from the Business 80 Bridge (RM 5) to the Nimbus Dam (RM 23) (Hannon and Deason, 2005).

POPULATION TRENDS

Populations of naturally spawned Central Valley steelhead are at significantly lower levels than historical levels, and are now composed predominantly of hatchery fish. No reliable estimates for Central Valley steelhead populations exist prior to the construction of the majority of the dams now blocking access to their historical spawning grounds. The California Fish and Wildlife Plan of 1965 estimated the combined annual run size for Central Valley and San Francisco Bay tributaries to be about 40,000 during the 1950s (CDFW 1965, as cited in McEwan and Jackson 1996). The spawning population during the mid-1960s for the Central Valley basin was estimated at nearly 27,000 (CDFW 1965, as cited in McEwan and Jackson 1996). Staley (1976) estimated steelhead populations in the American River in the 1971 to 1972 run to be 19,583 fish, and in the 1973 to 1974 run to be 12,274 fish. These numbers likely consisted of

both hatchery and wild steelhead. McEwan and Jackson (1996) estimated the annual run size for the Central Valley basin to be less than 10,000 adults by the early 1990s.

The U.S. Bureau of Reclamation (BOR) conducted a spawning survey study for Central Valley steelhead in the American River between 2002 and 2005 and concluded that the annual spawning population ranged from 162 to 479 spawning fish based on the redd count population estimate method. Estimates of fry production ranged from 220,000 to 450,000, and survival to the smolt stage was estimated at 7,359 to 27,392 over this period. Hatchery smolt production averaged around 400,00 over this period. During 2003, 2004, and 2005, only 9.5 percent, 6.3 percent, and 28.6 percent respectively of the spawning adult steelhead observed were naturally spawned. Hannon and Deason (2005) concluded that the survival of naturally spawned Central Valley steelhead in the American River had a significantly higher survival rate than hatchery produced fish.

The BOR spawning survey study documented Central Valley steelhead redds within the Action Area in 2002, 2003, and 2004. The majority of the newly constructed redds were observed between mid-February and early March. Central Valley steelhead fry emergence in the American River typically peaks between early and mid-April. Fry and early stage juveniles stay in proximity to spawning areas before dispersing throughout the river and occupying more complex habitat (e.g. side channels, flow breaks, and instream cover). Older young of year and yearling juveniles typically occupy riffle and swift run habitats.

STRESS FACTORS

Stressors affecting abundance, persistence, and recovery have been identified for anadromous fishes in the Sacramento and San Joaquin River systems. Stressors affecting Central Valley steelhead include: water diversions and water management; entrainment; dams and other structures; bank protection; genetic homogeneity from hatchery produced stock; dredging and sediment disposal; gravel mining; predation; invasive aquatic organisms; fishery management practices; elevated water temperatures, and various pollutants (fine sediments, heavy metals, and pesticides) (Upper Sacramento River FRHAC 1989; Reynolds and others 1990, 1993; CALFED 2000; CMARP Steering Committee 1999; as cited in McEwan 2001). McEwan and Jackson (1996) state that the primary stressors specific to Central Valley steelhead are all related to water development and water management.

EXISTING CONDITIONS WITHIN THE ACTION AREA AND PRIMARY CONSTITUENT ELEMENTS

The Action Area contains three of the PCEs for Central Valley steelhead. This section provides a discussion of each PCE under the existing conditions of the Action Area.

PCE (1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.

The reach of the American River within the Action Area consists of mostly run and glide flow habitats at flows between 500 and 2,000 cfs. Central Valley steelhead spawning in the American River show a preference for redd construction within glide habitat (Hannon and Deason, 2005). Based on review of reconnaissance photographs and field surveys, it appears that the instream substrate within the Action Area consists mainly of medium and large cobbles, although there appear to be patches of gravel suitable for spawning, incubation, and larval development.

Water quality parameters within the Action Area are generally conducive to Central Valley steelhead spawning, incubation, and larval development. Water temperatures within the spawning, incubation, and rearing window for Central Valley steelhead (mid-November through mid-May) usually range from 9 °C to 17 °C (48 °F to 62 °F) which are generally within the ideal range for these life stages (USGS, 2015; Moyle 2002). Dissolved oxygen concentrations within the American River are at or above 10 mg/ml during the Central Valley Steelhead spawning, incubation, and larval development period, which is within the suitable range for these life stages (LSA, 2003; Moyle, 2002) In general, American River water meets regulatory standards for toxicity (Sacramento River Watershed Program, 2014).

PCE (2) Freshwater rearing sites with:

(i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;

(ii) Water quality and forage supporting juvenile development; and

(iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

Flows within the reach of the American River within the Action Area are controlled by releases from Folsom and Nimbus dams. In general, water quantity within the Action Area is sufficient to support juvenile rearing of Central Valley steelhead, as it provides sufficient connectivity between in-channel flow regimes and habitat units. However, water releases from Folsom and Nimbus dams in dry years are limited by other regulatory agencies, and may not be sufficient to provide juvenile Central Valley steelhead access to floodplain habitat. Water quality parameters within the American River are generally conducive to rearing of Central Valley Steelhead. Even in low water years, water temperatures rarely exceed 20 °C (68 °F) at the USGS gage 1145600 at Fair Oaks (USGS, 2015; Moyle, 2002). Although there is little information in the literature on forage or prey items such as benthic macroinvertebrates and zooplankton abundance, it would appear that there is an adequate prey base to support rearing of current population levels of juvenile Central Valley steelhead within the Action Area of the American River. Natural cover within the Action Area is relatively sparse and consists mainly of some boulders, large cobbles. The existing riparian corridor provides minimal shading along portions of the north bank. Side channels and undercut banks are lacking at typical base flows.

PCE (3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

The reach of the American River within the Action Area is relatively unobstructed and is passable at all limbs of the hydrograph for both adult Central Valley steelhead migrating to spawning habitat and juveniles emigrating downstream to estuarine and ocean habitat. As mentioned above, water quality parameters are generally suitable for other life stages of Central Valley steelhead. Natural cover within the Action Area is relatively sparse and consists mainly of boulders and large cobbles. The existing riparian corridor provides minimal shading along portions of the north bank. Side channels and undercut banks are lacking at typical base flows.

POTENTIAL EFFECTS ON CENTRAL VALLEY STEELHEAD

Suitable spawning and rearing habitat for Central Valley steelhead occurs within the Action Area. Construction activities have the potential to adversely affect Central Valley steelhead spawning, rearing, and migration within the Action Area. Removal of the existing pipeline within the river could result in injury or mortality to Central Valley steelhead eggs, fry, and juveniles in the immediate vicinity of the pipeline or result in disturbance and mobilization of sediment that has the potential to adversely affect Central Valley steelhead eggs, fry and juveniles. As part of the project design, removal of the existing abandoned pipeline will between September and October 15 after Central Valley steelhead egg and fry life stages are completed, and therefore they are not likely to be adversely affected by removal of the existing pipeline (**Table 2**). Juvenile Central Valley steelhead present in the immediate area would likely move from the immediate area upon the initial disturbance activities. However, juveniles that do not vacate the immediate area during removal of the existing pipeline have the potential to be adversely affected through injury or mortality. Juveniles moving from the immediate area may become more susceptible to predation. Mobilization and transport of sediment associated with removal of the existing pipeline could result in affects to Central Valley steelhead spawning in subsequent seasons by reducing the quality of spawning gravels through the filling of some interstitial spaces. However, potential effects of sediment mobilization and transport associated with the removal of the abandoned pipeline would likely be transitory in nature. Removal of the abandoned pipeline and associated concrete encasement debris would have a beneficial long term effect on Central Valley steelhead because the area of the river bottom now occupied by the pipeline and concrete encasement debris would be replaced by cobble and gravel substrate similar to the adjacent areas.

Construction activities associated with pipeline construction beneath the American River, as well as staging and operation of equipment within the staging areas, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central

Valley steelhead eggs, fry, and juveniles, depending on the timing of construction activities. However, implementation of the following avoidance measures will reduce potential adverse effects to Central Valley steelhead:

1. All construction activities associated with the new pipeline alignment shall occur outside of the American River channel and riparian corridor. Horizontal directional drilling shall be utilized to construct the new pipeline alignment 85 feet below the channel bottom.
2. Avoidance measures to protect direct/indirect effects to riparian habitat shall include the establishment and maintenance of appropriate buffer zones along the adjoining riparian corridor outside the project site. Buffer zones shall be delineated using orange construction fencing. No equipment storage or other construction activity shall occur within the riparian buffer zones.
3. A Stormwater Pollution Prevention Plan (SWPPP) utilizing best management practices (BMPs) shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat.
4. A CDFW-approved frac-out contingency plan for horizontal directional drilling shall be prepared and implemented by the drilling contractor to minimize the potential for frac-out, provide early detection of frac-outs, protect aquatic resources, and provide notification to CDFW immediately if a frac-out event is observed.
5. All equipment re-fueling and maintenance shall occur in an approved staging area outside of the riparian zone and an agency-approved spill prevention plan will implemented by the contractor.
6. The construction of the pipeline shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.

Implementation of the above avoidance measures will reduce potential affects to Central Valley steelhead to the *may affect, but is not likely to adversely affect* level for the pipeline construction beneath the American River, as well as for staging and operation of equipment within the staging areas.

Construction activities associated with culvert replacement in the unnamed drainage including culvert replacement, including re-sloping of the drainage and creation of step pools, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley steelhead eggs, fry, and juveniles. However, implementation of the following avoidance measures will reduce potential adverse effects to Central Valley steelhead:

1. The discharge flow from the Aerojet GET LB facility will either be turned off or diverted through a temporary pipeline directly into the American River during culvert replacement, re-grading, and pool creation to prevent erosion and siltation.

2. All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-approved spill prevention plan will implemented by the contractor.
3. The culvert replacement shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during culvert replacement.
4. The culvert replacement shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.

Implementation of the above avoidance measures will reduce potential affects to Central Valley steelhead to the *may effect, but is not likely to adversely affect* level for the culvert replacement.

Construction activities associated with the removal of the concrete vaults from the north bank of the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley steelhead eggs, fry, and juveniles. However, implementation of the following avoidance measures will reduce potential adverse effects to Central Valley steelhead:

1. Removal of the concrete vaults shall occur between September 1 and October 15, when the flows in the American River are at their lowest seasonal levels (typically between 500 and 1,500 cfs) and after Central Valley steelhead egg and fry life stages are completed.
2. Bank stabilization measures shall be implemented immediately after removal of the concrete vaults to prevent erosion. These measures include, but are not limited to, grading to reduce the bank gradient, installation of erosion blankets, and re-vegetating with native riparian plant species.
3. All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-approved spill prevention plan will implemented by the contractor.
4. The concrete vault removal shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during vault removal.
5. The removal of the concrete vaults shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.

Implementation of the above avoidance measures will reduce potential affects to Central Valley steelhead to the *may affect, but is not likely to adversely affect* level for the removal of the abandoned concrete vaults.

Construction activities associated with removal of the abandoned pipeline across the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley steelhead eggs, fry, and juveniles, depending on the timing of construction activities. The area of impact associated with the pipeline removal consists of approximately 300 linear feet of a 33-inch diameter pipeline and associated concrete and rebar debris to be removed (approximately 87 cubic yards). The in-channel impact or work area is estimated to extend no more than 10 feet on either side of the pipeline, for a maximum temporary impact to 0.069 acre of the American River, which is Central Valley steelhead critical habitat. There are no long-term impacts associated with Central Valley steelhead critical habitat, as the removal of the abandoned pipeline will result in a long-term benefit to the American River. Implementation of the following avoidance measures will reduce potential adverse effects to Central Valley steelhead during construction:

1. Removal of the existing pipeline shall occur between September 1 and October 15, when the flows in the American River are at their lowest seasonal levels (typically between 500 and 1,500 cfs) and after Central Valley steelhead egg and fry life stages are completed and therefore will not be adversely affected by removal of the existing pipeline.
2. Consultation with NMFS, CDFW, and the Central Valley RWQCB shall occur to determine the BMPs required to minimize disturbance and mobilization of sediment during the abandoned pipeline removal. BMPs may include but are not limited to moveable silt or sediment containment curtains and coffer dams.
3. The abandoned pipeline shall be cut where it emerges from the banks and will either be lifted by crane or chained and dragged from the river channel from the staging area on the south bank. Similarly, nearshore concrete debris will lifted by crane or dragged from the river channel from staging areas on the north and south banks. To the extent feasible, no equipment will be operated within the wetted channel. To help ensure that work in the immediate vicinity of the bank does not result in sediment discharge into the American River, coffer dams may be utilized during the pipeline and debris removal activities.
4. A qualified biological monitor shall be present on-site during the pipeline removal.
5. All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-approved spill prevention plan will implemented by the contractor.
6. The pipeline removal shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during pipeline removal.
7. The removal of the abandoned pipeline shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.

Implementation of the above avoidance measures will reduce potential affects to Central Valley steelhead to the *may affect, but is not likely to adversely affect* level for the removal of the abandoned pipeline.

POTENTIAL EFFECTS ON CENTRAL VALLEY STEELHEAD CRITICAL HABITAT

The Action Area contains three of the PCEs for Central Valley steelhead critical habitat, as shown in **Table 3**. This section provides a discussion potential effects to each PCE resulting from project activities.

TABLE 3
CENTRAL VALLEY STEELHEAD PCEs IN THE ACTION AREA

PCE	PCE is Present and "Healthy" in the Action Area	PCE is Present but at Risk within the Action Area	PCE Requirement Cannot be Met in the Action Area
1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.	Water quantity and quality is sufficient for spawning, incubation, and larval development.	--	--
2. Freshwater rearing sites with: i. Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; ii. Water quality and forage supporting juvenile development; and iii. Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.	--	Water quality is sufficient, however floodplain connectivity is at risk by existing and planned developments.	--
3. Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.	Freshwater migration corridors exist in the Action Area	--	--

POTENTIAL IMPACTS TO PCE (1) – CENTRAL VALLEY STEELHEAD CRITICAL HABITAT

Construction activities associated with pipeline construction beneath the American River, as well as staging and operation of equipment within the staging areas, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (1)** for Central Valley steelhead critical habitat. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (1)** Central Valley steelhead critical habitat:

1. Implement Measures 1 through 6 in the *Potential Effects on Central Valley Steelhead* Section above for construction of the pipeline under the American River.

Implementation of the above avoidance measures will reduce potential affects to **PCE (1)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the pipeline construction beneath the American River, as well as for staging and operation of equipment within the staging areas.

Construction activities associated with culvert replacement in the unnamed drainage including culvert replacement, including re-sloping of the drainage and creation of step pools, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (1)** for Central Valley steelhead eggs, fry, and juveniles. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (1)** Central Valley steelhead critical habitat:

1. Implement Measures 1 through 4 in the *Potential Effects on Central Valley Steelhead* Section above for construction of the culvert replacement.

Construction activities associated with the culvert replacement will not impact water quantity for **PCE (1)**. Temporary impacts to water quality and spawning substrates may occur from sediment disturbance and mobilization, although these impacts would be transitory in nature and would not be expected to impact **PCE (1)** during the period of Central Valley steelhead spawning, incubation, and larval development (**Table 2**). Implementation of the above avoidance measures will reduce potential affects to **PCE (1)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the culvert replacement.

Construction activities associated with the removal of the concrete vaults from the north bank of the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (1)** for Central Valley steelhead critical habitat. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (1)** for Central Valley steelhead critical habitat:

1. Implement Measures 1 through 5 in the *Potential Effects on Central Valley Steelhead* Section above for the removal of the concrete vaults.

Construction activities associated with the removal of the concrete vaults will not impact water quantity for **PCE (1)**. Temporary impacts to water quality and spawning may occur from sediment disturbance and mobilization, although these impacts would be transitory in nature and would not be expected to impact **PCE (1)** during the period of Central Valley steelhead spawning, incubation, and

larval development (**Table 2**). Implementation of the above avoidance measures will reduce potential affects to **PCE (1)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the removal of the concrete vaults.

Construction activities associated with removal of the abandoned pipeline across the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (1)** for Central Valley critical habitat. The area of impact associated with the pipeline removal consists of a maximum temporary impact to 0.069 acre of the American River. There are no long-term impacts associated with Central Valley steelhead critical habitat, as the removal of the abandoned pipeline will result in a long-term benefit to the American River. Implementation of the following avoidance measures will reduce potential adverse effects to **PCE (1)** for Central Valley steelhead critical habitat:

1. Implement Measures 1 through 7 in the *Potential Effects on Central Valley Steelhead* Section above for the removal of the abandoned pipeline.

Removal of the abandoned pipeline will not impact water quantity for **PCE (1)**. Temporary impacts to water quality and spawning substrates may occur from sediment disturbance and mobilization, although these impacts would be transitory in nature and would not be expected to impact **PCE (1)** during the period of Central Valley steelhead spawning, incubation, and larval development (**Table 2**). Implementation of the above avoidance measures will reduce potential affects to **PCE (1)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the removal of the abandoned pipeline.

POTENTIAL IMPACTS TO PCE (2) – CENTRAL VALLEY STEELHEAD CRITICAL HABITAT

Construction activities associated with pipeline construction beneath the American River, as well as staging and operation of equipment within the staging areas, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (2)** for Central Valley steelhead critical habitat. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (2)** Central Valley steelhead critical habitat:

1. Implement Measures 1 through 6 in the *Potential Effects on Central Valley Steelhead* Section above for construction of the pipeline under the American River.

The construction activities associated with the pipeline construction beneath the American River will not result in direct impacts to any of the parameters specified for **PCE (2)** including water quantity, water quality, forage, or cover necessary for Central Valley steelhead rearing. Implementation of the above avoidance measures will reduce any potential affects resulting from indirect impacts to **PCE**

(2) for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the pipeline construction beneath the American River, as well as for staging and operation of equipment within the staging areas.

Construction activities associated with culvert replacement in the unnamed drainage including culvert replacement, including re-sloping of the drainage and creation of step pools, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (2)** for Central Valley steelhead eggs, fry, and juveniles. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (2)** Central Valley steelhead critical habitat:

1. Implement Measures 1 through 4 in the *Potential Effects on Central Valley Steelhead* Section above for construction of the culvert replacement.

The construction activities associated with the culvert replacement will not result in direct impacts to any of the parameters specified for **PCE (2)** including water quantity, water quality, forage, or cover necessary for Central Valley steelhead rearing. Implementation of the above avoidance measures will reduce any potential affects resulting from indirect impacts to **PCE (2)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the culvert replacement.

Construction activities associated with the removal of the concrete vaults from the north bank of the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (2)** for Central Valley steelhead critical habitat. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (2)** for Central Valley steelhead critical habitat:

1. Implement Measures 1 through 5 in the *Potential Effects on Central Valley Steelhead* Section above for the removal of the concrete vaults.

The construction activities associated with the removal of the abandoned concrete vaults will not result in direct impacts to any of the parameters specified for **PCE (2)** including water quantity, water quality, forage, or cover necessary for Central Valley steelhead rearing. Implementation of the above avoidance measures will reduce any potential affects resulting from indirect impacts to **PCE (2)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the concrete vault removal.

Construction activities associated with removal of the abandoned pipeline across the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (2)** for Central Valley critical habitat. The area of impact

associated with the pipeline removal consists of a maximum temporary impact to 0.069 acre of the American River. There are no long-term impacts associated with Central Valley steelhead critical habitat, as the removal of the abandoned pipeline will result in a long-term benefit to the American River. Implementation of the following avoidance measures will reduce potential adverse effects to **PCE (2)** for Central Valley steelhead critical habitat:

1. Implement Measures 1 through 7 in the *Potential Effects on Central Valley Steelhead* Section above for the removal of the abandoned pipeline.

Construction activities associated with the removal of the abandoned pipeline will not impact water quantity for **PCE (2)**. Temporary impacts to water quality and foraging habitat may occur from sediment disturbance and mobilization, although these impacts would be transitory in nature and could actually provide a short-term increase in downstream forage abundance. No impacts to natural cover would occur during removal of the abandoned pipeline. Implementation of the above avoidance measures will reduce potential affects to **PCE (2)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the removal of the abandoned pipeline.

POTENTIAL IMPACTS TO PCE (3) – CENTRAL VALLEY STEELHEAD CRITICAL HABITAT

Construction activities associated with pipeline construction beneath the American River, as well as staging and operation of equipment within the staging areas, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (3)** for Central Valley steelhead critical habitat. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (3)** Central Valley steelhead critical habitat:

1. Implement Measures 1 through 6 in the *Potential Effects on Central Valley Steelhead* Section above for construction of the pipeline under the American River.

The construction activities associated with the pipeline construction beneath the American River will not result in direct impacts to any of the parameters specified for **PCE (3)** including water quantity, water quality, and cover, nor will it create obstructions or increase predation rates during adult Central Valley steelhead migration and juvenile emigration. Implementation of the above avoidance measures will reduce any potential effects to **PCE (3)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the pipeline construction beneath the American River, as well as for staging and operation of equipment within the staging areas.

Construction activities associated with culvert replacement in the unnamed drainage including culvert replacement, including re-sloping of the drainage and creation of step pools, could result in

sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (3)** for Central Valley steelhead eggs, fry, and juveniles. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (3)** Central Valley steelhead critical habitat:

1. Implement Measures 1 through 4 in the *Potential Effects on Central Valley Steelhead* Section above for construction of the culvert replacement.

The construction activities associated with the culvert replacement will not result in direct impacts to any of the parameters specified for **PCE (3)** including water quantity, water quality, and cover, nor will it create obstructions or increase predation rates during adult Central Valley steelhead migration and juvenile emigration. Implementation of the above avoidance measures will reduce any potential effects to **PCE (3)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the culvert replacement.

Construction activities associated with the removal of the concrete vaults from the north bank of the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (3)** for Central Valley steelhead critical habitat. However, implementation of the following avoidance measures will reduce potential adverse effects to **PCE (3)** for Central Valley steelhead critical habitat:

1. Implement Measures 1 through 5 in the *Potential Effects on Central Valley Steelhead* Section above for the removal of the concrete vaults.

The construction activities associated with the removal of the abandoned concrete vaults will not result in direct impacts to any of the parameters specified for **PCE (3)** including water quantity, water quality, and cover, nor will it create obstructions or increase predation rates during adult Central Valley steelhead migration and juvenile emigration. Implementation of the above avoidance measures will reduce any potential effects to **PCE (3)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the concrete vault removal.

Construction activities associated with removal of the abandoned pipeline across the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect **PCE (3)** for Central Valley critical habitat. The area of impact associated with the pipeline removal consists of a maximum temporary impact to 0.069 acre of the American River. There are no long-term impacts associated with Central Valley steelhead critical habitat, as the removal of the abandoned pipeline will result in a long-term benefit to the American River. Implementation of the following avoidance measures will reduce potential adverse effects to **PCE (3)** for Central Valley steelhead critical habitat:

1. Implement Measures 1 through 7 in the *Potential Effects on Central Valley Steelhead* Section above for the removal of the abandoned pipeline.

The construction activities associated with the removal of the abandoned pipeline will not result in direct impacts to any of the parameters specified for **PCE (3)** including water quantity, water quality, and cover, nor will it create obstructions or increase predation rates during adult Central Valley steelhead migration and juvenile emigration. Implementation of the above avoidance measures will reduce any potential effects to **PCE (3)** for Central Valley steelhead critical habitat to the *may affect, but is not likely to adversely affect* level for the removal of the abandoned pipeline.

5.2 CENTRAL VALLEY FALL/LATE-FALL RUN CHINOOK SALMON (*ONCORHYNCHUS TSHAWYTSCHA*)

Federal Status – Species of Special Concern
State Status – Species of Special Concern (Imperiled)

The range of the Central Valley fall/late-fall run Chinook Salmon evolutionarily significant unit (ESU) includes all naturally spawned populations of fall/late-fall run Chinook salmon in the Sacramento and San Joaquin river basins east of the Carquinez Strait. Within the Sacramento River basin, most Central Valley fall/late-fall run Chinook Salmon spawn in the mainstem Sacramento River between the Red Bluff Diversion Dam and Keswick Dam, although some fish spawn downstream of the Red Bluff Diversion Dam and in the American, Feather, and Yuba rivers. Small numbers also spawn in Battle Creek, Cottonwood Creek, Clear Creek, Mill Creek, as well as some other small tributaries to these rivers.

Adult Central Valley fall/late-fall run Chinook Salmon begin their migration from the ocean in the late summer through late fall and typically arrive on their spawning grounds between late September through early January. Spawning takes place in riffles, pool tailouts and other suitable habitats at water depths ranging from 0.25 m to 1.0 m (0.82 to 3.28 ft) and flow velocities of 0.3 to 0.8 meter per second (0.98 to 2.62 feet per second). Preferred spawning substrate consists of gravel and small cobble ranging 0.3 cm to 15 cm (0.12 to 5.90 inches) diameter. The optimum temperature for egg development is 40 to 50 °F (4 to 10 °C). After emergence, fry seek rear in shallow edge water habitat for the several weeks to several months after which they disperse into suitable mid-channel habitat. Optimum juvenile growth and survival occurs at temperatures ranging from 54 to 60 °F (12 to 15 °C) with dissolved oxygen of greater than 7 mg/L. Juveniles typically remain in the freshwater environment for one to seven months years prior to emigrating to the Pacific Ocean. They typically spend one to four years in the ocean foraging on crustaceans, small fish, and squid before reaching maturity and returning to their natal streams to spawn (Moyle 2002; Meyers et al., 1998; Yoshiyama et al., 1998). Table 2 presents the life history periodicity of Central Valley fall-late fall-run Chinook Salmon in the American River.

TABLE 4
CENTRAL VALLEY FALL/LATE-FALL RUN CHINOOK SALMON LIFE STAGE USE BY MONTH, AMERICAN RIVER

Life Stage	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Adult Migration	x								x	X	X	X
Spawning	X	x								X	X	X
Incubation/Emergence	X	X	x	x						X	X	X
Juvenile Rearing	x	X	X	X	X	X	X					
Juvenile Emigration		x	X	X	X	X	X					

X – Peak Occurrence; x – Life Stage Present
Source: Williams, 2001

ENVIRONMENTAL BASELINE FOR CENTRAL VALLEY FALL/LATE-FALL RUN CHINOOK SALMON

PRESENT AND HISTORICAL DISTRIBUTION

The present distribution of Central Valley fall/late-fall run Chinook Salmon has been greatly reduced, mostly due to the construction of impassable dams that block access to essential spawning and rearing habitat. The California Advisory Committee on Salmon and Steelhead Trout estimated that there has been a 95 percent reduction in spawning habitat for Central Valley anadromous fish (CACSST, 1988). Yoshiyama and others (1998) estimated that 82 percent of historical Central Valley fall/late-fall run Chinook Salmon spawning and rearing habitat in the Central Valley has been lost. Historically, Central Valley fall/late-fall run Chinook Salmon spawned in nearly all rivers and streams within Sacramento and San Joaquin river basins, limited only by natural fish barriers such as waterfalls. Rivers or river reaches no longer accessible to Central Valley fall/late-fall run Chinook Salmon include: the upper Sacramento, McCloud, Pit; the Feather upstream of Oroville Dam, the American upstream of Nimbus Dam, and the Yuba upstream of Englebright Dam.

POPULATION TRENDS

Historical population estimates for fall/late-fall run Chinook Salmon range on the order of one to two million prior to hydraulic mining practices and the construction of impassable dams. Recent population trends of fall/late-fall run Chinook Salmon have fluctuated wildly in within the last 20 years, ranging from a low of around 40,000 in 2010 to over 700,000 as recently as 2002 (CDFW, 2014b). The population now consists of mostly hatchery produced fish.

STRESS FACTORS

Stressors affecting abundance, persistence, and recovery have been identified for anadromous fishes in the Sacramento and San Joaquin River systems. Stressors affecting Central Valley fall/late-fall run

Chinook salmon include water diversions and water management; entrainment; dams and other structures; bank protection; dredging and sediment disposal; gravel mining; invasive aquatic organisms; fishery management practices; and contaminants (Upper Sacramento River FRHAC 1989; Reynolds and others 1990, 1993; CALFED 2000; CMARP Steering Committee 1999, as cited in McEwan 20001).

EXISTING CONDITIONS WITHIN THE ACTION AREA

Existing conditions within the American River portion of the Action Area are described in **Section 5.1**.

No PCEs have been adopted for this run; therefore, for the purpose of evaluating potential impacts of the Proposed Project on Central Valley fall/late-fall run Chinook salmon EFH, potential impacts to PCEs (1), (2), and (3) for Central Valley steelhead critical habitat are used as a surrogate method of determining potential impacts. There are a number of similarities between the components of EFH for Central Valley fall/late-fall run Chinook salmon and PCEs for Central Valley steelhead critical habitat, including: water quantity and quality; suitable substrate for spawning, incubation, rearing, and migration; forage abundance for rearing; and natural cover for rearing and migration.

POTENTIAL EFFECTS TO CENTRAL VALLEY FALL/LATE-FALL RUN CHINOOK SALMON AND ITS DESIGNATED ESSENTIAL FISH HABITAT

The Action Area is within the designated EFH for Central Valley fall/late-fall run Chinook salmon. As described previously, suitable spawning and rearing habitat for Central Valley fall/late-fall run Chinook Salmon occur within the Action Area. Construction activities have the potential to adversely affect Central Valley fall/late-fall run Chinook salmon spawning, rearing, and migration within the Action Area. Similar to the discussion presented for Central Valley steelhead in **Section 5.1**, construction of the project components may adversely affect Central Valley fall/late-fall run Chinook Salmon and designated EFH for Central Valley fall/late-fall run Chinook salmon within the American River. As PCEs are not defined for EFH, the discussion of potential effects of the Proposed Project to Chinook salmon EFH uses applicable PCEs (1), (2), and (3) for Central Valley steelhead critical habitat.

Construction activities associated with pipeline construction beneath the American River, as well as staging and operation of equipment within the staging areas, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley fall/late-fall run Chinook Salmon eggs, fry, and juveniles, depending on the timing of construction activities. As discussed above, the EFH for Central Valley fall/late-fall run Chinook salmon shares similar attributes to PCEs (1), (2), and (3) for Central Valley steelhead critical habitat. Construction activities associated with pipeline construction could impact designated EFH for Chinook salmon. However, implementation of the following avoidance measures will reduce potential adverse effects to Central Valley Chinook salmon and its designated EFH:

1. Implement Measures 1 through 6 in the *Potential Effects on Central Valley Steelhead* Section above for construction of the pipeline under the American River.

Implementation of the above avoidance measures will reduce potential affects to Central Valley Chinook salmon and its designated EFH to the *may affect, but is not likely to adversely affect* level for the pipeline construction beneath the American River, as well as for staging and operation of equipment within the staging areas.

Construction activities associated with culvert replacement in the unnamed drainage including culvert replacement, including re-sloping of the drainage and creation of step pools, could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley fall/late-fall run Chinook Salmon eggs, fry, and juveniles, depending on the timing of construction activities, as well as designated EFH. However, implementation of the following avoidance measures will reduce potential adverse effects to Central Valley Chinook salmon and its designated EFH:

1. Implement Measures 1 through 4 in the *Potential Effects on Central Valley Steelhead* Section above for construction of the culvert replacement.

Construction activities associated with the culvert replacement will not impact water quantity for Chinook salmon EFH. Temporary impacts to water quality and spawning substrates may occur from sediment disturbance and mobilization, although these impacts would be transitory in nature and would not be expected to impact Central Valley fall/late-fall run Chinook salmon spawning, incubation, and larval development (**Table 4**). Implementation of the above avoidance measures will reduce potential affects to Central Valley Chinook salmon and its designated EFH to the *may affect, but is not likely to adversely affect* level for the culvert replacement.

Construction activities associated with the removal of the concrete vaults from the north bank of the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley fall/late-fall run Chinook Salmon eggs, fry, and juveniles, depending on the timing of construction activities, as well as designated EFH. However, implementation of the following avoidance measures will reduce potential adverse effects to Central Valley Chinook salmon and its designated EFH:

1. Implement Measures 1 through 5 in the *Potential Effects on Central Valley Steelhead* Section above for the removal of the concrete vaults.

Construction activities associated with the removal of the concrete vaults will not impact water quantity for Chinook salmon EFH. Temporary impacts to water quality and spawning may occur

from sediment disturbance and mobilization, although these impacts would be transitory in nature and would not be expected to impact Central Valley fall/late-fall run Chinook salmon spawning, incubation, and larval development (**Table 4**). Implementation of the above avoidance measures will reduce potential effects to Central Valley Chinook salmon and its designated EFH to the *may affect, but is not likely to adversely affect* level for the removal of the concrete vaults.

Construction activities associated with removal of the abandoned pipeline across the American River could result in sediment discharge and/or fuel, oil, hydrologic fluid spills within the Action Area that have the potential to adversely affect Central Valley fall/late-fall run Chinook Salmon eggs, fry, and juveniles, depending on the timing of construction activities, as well as designated EFH. The area of impact associated with the pipeline removal consists of a maximum temporary impact to 0.069 acre of the American River. There are no long-term impacts associated with Chinook salmon EFH, as the removal of the abandoned pipeline will result in a long-term benefit to the American River. Implementation of the following avoidance measures will reduce potential adverse effects to Central Valley Chinook salmon and its designated EFH:

1. Implement Measures 1 through 7 in the *Potential Effects on Central Valley Steelhead* Section above for the removal of the abandoned pipeline.

Removal of the abandoned pipeline will not impact water quantity for Chinook salmon EFH. Temporary impacts to water quality and spawning substrates may occur from sediment disturbance and mobilization, although these impacts would be transitory in nature and would not be expected to impact Central Valley fall/late-fall run Chinook salmon spawning, incubation, and larval development (**Table 4**). Implementation of the above avoidance measures will reduce potential effects to Central Valley Chinook salmon and its designated EFH to the *may affect, but is not likely to adversely affect* level for the removal of the abandoned pipeline.

5.3 VALLEY ELDERBERRY LONGHORN BEETLE (*DESMOCERUS CALIFORNICUS DIMORPHUS*)

Federal Status – Threatened
State Status – None

The valley elderberry longhorn beetle (VELB) is only found in close association with its host plant, elderberry (*Sambucus* spp.). Elderberry plants are found in or near riparian and oak woodland habitats. The VELB's life history follows a sequence of events similar to those of related taxa. Female beetles deposit eggs in crevices in the bark of living elderberry plants. Presumably, the eggs hatch shortly after they are laid, and the larvae bore into the pith of the trunk or stem. When larvae are ready to pupate, they move through the pith of the plant, open an emergence hole through the bark, and return to the pith for pupation. Adults exit through the emergence holes and can sometimes be found on elderberry foliage,

flowers, or stems or on adjacent vegetation. The presence of exit holes in elderberry stems indicates previous VELB habitat use. Exit holes are cylindrical and approximately 0.25 inch in diameter. Exit holes can be found on stems that are 1 or more inches in diameter. The holes may be located on the stems from a few inches to about 9 to 10 feet above the ground (Barr, 1991).

REGIONAL DISTRIBUTION AND CRITICAL HABITAT

The VELB's range extends from southern Shasta County to Fresno County (Talley et al. 2006). Along the eastern edge of the species' range, adult beetles have been found in the foothills of the Sierra Nevada at elevations up to 2,220 feet, and beetle exit holes have been located on elderberry plants at elevations up to 2,940 feet. Along the western edge of the species' range, adult beetles have been found on the eastern slopes of the Coast Ranges at elevations of up to 500 feet, and beetle exit holes have been detected on elderberry plants at elevations up to 730 feet (Barr, 1991). There is critical habitat listed for the VELB along the American River both upstream and downstream of the Action Area (**Figure 6**).

POTENTIAL TO OCCUR IN THE ACTION AREA

The Action Area provides potentially suitable habitat for the federally listed VELB, which may occur in the elderberry shrubs identified within the Action Area along the American River, as shown on **Figure 4** and **Figure 7**. These elderberry shrubs have stems measuring between 1 and 3 inches at ground level and may or may not have emergence holes. Construction activities would occur approximately 75 to 100 feet from these shrubs.

POTENTIAL IMPACTS TO VELB

The USFWS Conservation Guidelines state that no adverse effects to VELB are expected when project activities occur at least 100 feet from elderberry shrubs with stems measuring at least one inch diameter at ground level. The shrubs were not inspected for emergence holes as they will be avoided by construction activities, regardless of the presence or absence of the holes. Construction activities will be occurring within 100 feet of the two identified elderberry shrubs. However, the elderberry shrubs are located 75 to 100 feet away from the construction activities, along an existing road which will be used to transport equipment (**Figure 7**). Therefore, avoidance and minimization measures identified below would ensure that the project *may affect, but is not likely to adversely affect* valley elderberry longhorn beetle.

The following mitigation measures are recommended to avoid or minimize potential for adverse affects to VELB:

1. Install high-visibility, orange construction fencing along the existing road edge that will restrict access to the two elderberry shrubs that are located within the Action Area.
2. No equipment storage or other construction activity will occur within the vicinity of the elderberry shrubs outside of the existing road.

SOURCE: DigitalGlobe aerial photograph, 4/18/2014; AES 2015

Figure 7
Elderberry Shrubs

POTENTIAL IMPACTS TO VELB CRITICAL HABITAT

The Action Area is not part of designated critical habitat, therefore no further review is presented.

5.4 YELLOW-BILLED CUCKOO (*COCCYZUS AMERICANUS OCCIDENTALIS*) WESTERN DPS

Federal Status – Threatened
State Status – None

The yellow-billed cuckoo western DPS was listed as threatened on October 3, 2012 (79 FR59992). The cuckoo is a slender, long-tailed bird that usually stays well hidden within its preferred habitat of deciduous woodlands and dense, mature riparian corridors. They usually sit very still, even hunching their shoulders to conceal their crisp white underparts. Bold white spots on the tail's underside is often the most visible feature on a shaded perch (Cornell Lab, 2014). The breeding habitat consists of large blocks, or contiguous areas, of riparian habitat, particularly cottonwood–willow riparian woodlands (66 FR 38611–38626). The yellow-billed cuckoo prefers dense riparian thickets with dense low-level foliage near slow-moving water sources (Dudek/ICF, 2012).

The western yellow-billed cuckoo has a short breeding season, lasting only about four months from time of arrival on breeding grounds in the spring to fall migration (Dudek/ICF, 2012). Pairs may visit prospective nest sites multiple times before building a nest together. Nest heights can range from 3 feet to as much as 90 feet off the ground, with the nest placed on a horizontal branch or in a fork of a tree or large shrub (Cornell Lab, 2014). Breeding season for western yellow-billed cuckoo is generally between late May and August (USFWS, 2014c).

REGIONAL DISTRIBUTION AND CRITICAL HABITAT

Western yellow-billed cuckoos use wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes (Cornell Lab, 2014). Within the Sacramento Valley, the south coast (including Ventura and Los Angeles counties), and Kern County, yellow-billed cuckoos were considered common to numerous in the late 1800s, but only fairly common by the 1920s (Hughes, 1999). However, by the 1950s, the subspecies had been extirpated north of Sacramento Valley (Hughes, 1999). Currently, the CNDDB has the western yellow-billed cuckoo presumed extant within Butte, Colusa, Glenn, Sutter, and Yuba County. The closest known sightings was from 2013 over 3.25 miles downstream of the Action Area at William B. Pond Recreation Area.

Critical habitat was proposed for the cuckoo on August 15, 2014 (79 FR 48548). The PCEs include:

(1) Riparian woodlands. Riparian woodlands with mixed willow-cottonwood vegetation, mesquite-thorn-forest vegetation, or a combination of these that contain habitat for nesting and foraging in

contiguous or nearly contiguous patches that are greater than 325 feet (100 m) in width and 200 acre (81 hectare) or more in extent. These habitat patches contain one or more nesting groves, which are generally willow-dominated, have above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats.

(2) Adequate prey base. Presence of a prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies) and tree frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.

(3) Dynamic riverine processes. River systems that are dynamic and provide hydrologic processes that encourage sediment movement and deposits that allow seedling germination and promote plant growth, maintenance, health, and vigor (e.g. lower gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). This allows habitat to regenerate at regular intervals, leading to riparian vegetation with variously aged patches from young to old.

However, the currently proposed critical habitat does not include the American River.

POTENTIAL TO OCCUR IN THE ACTION AREA

The Action Area provides marginal habitat for the western yellow-billed cuckoo. The south bank, particularly along Rossmoor Drive, is maintained with few trees and the understory has been largely cleared to facilitate access to the boat launch. There are little if any dense tree or shrub areas within the work area. Within the Action Area on the north bank, the riparian corridor may provide marginal habitat for the yellow-billed cuckoo. Although there are more trees and understory on the north side, the area is highly disturbed, with local utility companies maintaining infrastructure in the Action Area and the neighboring property owners utilizing the space for a patio area. It is unlikely that the yellow-billed cuckoo occurs in the Action Area because it contains only marginal habitat and is not located in proposed critical habitat.

POTENTIAL IMPACTS TO YELLOW-BILLED CUCKOO

Currently, there are no USFWS Conservation Guidelines for yellow-billed cuckoo western DPS. The Proposed Project may remove a limited number of shrubs located within the Action Area, but all impacted vegetation would be replaced with native vegetation. Avoidance and minimization measures identified below would ensure that the project *may affect, but is not likely to adversely affect* yellow-billed cuckoo western DPS:

1. To avoid removing or displacing any yellow-billed cuckoos nests, construction and vegetation/tree removal activities shall be conducted during the non-breeding season for this species (generally between September and April) to the extent feasible.

2. If tree and shrub trimming/ removal activities are conducted during breeding season (generally between late May and August), a qualified biologist shall conduct a preconstruction survey within 14 days prior to commencement of any construction activities to determine if active nests are present. A report shall be prepared and submitted to the District following the preconstruction survey to document the results. If surveys show that there is no evidence of nests, then no additional mitigation shall be required provided construction commences within 14 days prior to the preconstruction survey.
3. If any active nests of cuckoos are located within 500 feet of the Action Area, a no-disturbance buffer zone shall be established around the nests to avoid disturbance or destruction of the nest. The distance around the no-disturbance buffer shall be determined by the biologist in coordination with USFWS and will depend on the level of noise or construction activity, the level of ambient noise in the vicinity of the nest, and line-of-sight between the nest and disturbance. The biologist shall delimit the buffer zone with construction tape or pin flags. The no-disturbance buffer shall remain in place until after the nesting season (to be lifted August-September) or until the biologist determines that the young have fledged. A report shall be prepared and submitted to the District and USFWS following the fledging of the nestlings to document the results.

POTENTIAL IMPACTS TO YELLOW-BILLED CUCKOO CRITICAL HABITAT

The Action Area does not fall within the proposed critical habitat, and therefore no further review is presented.

5.5 CUMULATIVE EFFECTS ANALYSIS

For the purposes of this BA, cumulative effects are defined as the effects of past, present, and future federal, State, local, or private activities that are reasonably foreseeable in the Action Area. This BA only discusses activities occurring outside the Action Area if they result in effects within the Action Area.

Cumulative projects that are anticipated to occur in the vicinity of the Action Area may include residential developments within the town of Carmichael, City of Rancho Cordova, or County of Sacramento. However, there is no open space available for development within approximately three miles of the Action Area, as the immediate vicinity is already developed in residential development or the American River Parkway. Future residential development may occur outside of this radius, but would be outside of the geographic range that would be cumulatively considerable with the Proposed Project. Any future development in these areas would be required to mitigate impacts to biological resources based on the California Environmental Quality Act (CEQA), the California Endangered Species Act, the federal Clean Water Act, and FESA. No significant cumulative effects are reasonably anticipated to occur.

6.0 CONCLUSIONS AND DETERMINATION

The aquatic features, riparian, ruderal/disturbed, and annual grassland habitat within the Action Area may provide suitable habitat for special status wildlife species, including: Central Valley steelhead, Central Valley Chinook salmon, VELB, and yellow-billed cuckoo. Mitigation measures are required in **Section 5.1** through **Section 5.5** to reduce impacts to "*may affect, but not likely to adversely affect*" for all special status species.

The Proposed Project **may affect, but is not likely to adversely affect**, the following species, critical habitats, and EFH with the mitigation proposed herein:

- Central Valley steelhead DPS (*Oncorhynchus mykiss*)
- Central Valley steelhead (*Oncorhynchus mykiss*) Critical Habitat
- Central Valley fall/late fall run Chinook salmon EFH
- Valley elderberry longhorn beetle (*Desmocercus californicus dimorphus*)
- Yellow-billed cuckoo western DPS (*Coccyzus americanus*)

7.0 REFERENCES

66 FR 38611–38626. "Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition to List the Yellow-billed Cuckoo (*Coccyzus americanus*) in the Western Continental United States." July 25, 2001.

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APPENDIX A

REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

FEDERAL, STATE, AND CNPS POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES
SITE ELEVATION: 50-120 FEET
SITE HABITAT TYPES: RIPARIAN, GRASSLAND, RUDERAL DEVELOPED

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Plants					
Balsamorhiza macrolepis Big-scale balsamroot	--/--/1B.2	Known to occur in Alameda, Amador, Butte, Colusa, El Dorado, Lake, Mariposa, Napa, Placer, Santa Clara, Shasta, Solano, Sonoma, Tehama, and Tuolumne Counties (CNPS, 2014).	Occurs in chaparral, cismontane woodland, and valley and foothill grassland. Sometimes occurs in serpentine soils. Elevation ranges from 295-5,102 feet (CNPS, 2014).	March-June	**No.** The Action Area is outside of the known distribution of this species.
Chloropyron molle ssp. *hispidum* Hispid bird's beak	--/--/1B.1	Known to occur in Alameda, Fresno, Kern, Merced, Placer, and Solano Counties (CNPS, 2014).	Occurs in meadows and seeps, grasslands and playas. Elevation ranges from 3-509 feet (CNPS, 2014)	June-September	**No.** The project is outside of the known distribution for this species.
Cuscata obtusiflora var. *glandulosa* Peruvian dodder	--/--/2B.2	Known to occur in Butte, Merced, Los Angeles, Sacramento, San Bernardino, Sonoma, and Sutter Counties (CNPS, 2014).	Known to occur in freshwater marshes and swamps. Elevation ranges from 49-919 feet (CNPS, 2014)	July-October	**No.** The Action Area does not contain habitat to support this species.
Downingia pusilla dwarf downingia	--/--/2.2	Known to occur in Amador, Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties. Also occurs in South America (CNPS, 2014).	Found in Valley and foothill grassland (mesic) and vernal pools from 3 – 1,460 ft) (CNPS, 2014).	March-May	**No.** The annual grassland onsite does not contain vernal pool habitat and therefore does not provide suitable habitat for this species.
Gratiola heterosepala Boggs Lake hedge-hyssop	--/CE/1B.2	Known to occur in Fresno, Lake, Lassen, Madera, Merced, Modoc, Placer, Sacramento, Shasta, Siskiyou, San Joaquin, Solano, Sonoma, and Tehama counties in CA and in Oregon (CNPS, 2014).	Annual herb found on clay soils in vernal pools and along the lake margins of marshes and swamps from 33- 7,792 feet (CNPS, 2014).	April-August	**No.** The Action Area does not provide suitable soils or habitat for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Hibiscus lasiocarpos var. *occidentalis* Wooly rose-mallow	--/--/1B.2	Known to occur in Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo Counties (CNPS, 2014).	Often found on rip-rap on the sides of levees. Occurs in freshwater marshes and swamps. Elevation ranges from 0-394 feet (CNPS, 2014).	June-September	**Yes.** Suitable habitat for this species is present along the banks of the American River.
Juglans hindsii Northern California Black Walnut	--/--/1B	Known to occur in Contra Costa, Lake, Napa, Sacramento, Solano, and Yolo counties (CNPS, 2014).	Riparian forests and riparian woodlands. Elevation: 0-1,444 feet (CNPS, 2014).	April-May	**Yes.** Suitable habitat is present in the riparian corridor within the Action Area.
Juncus leiospermus var. *ahartii* Ahart's dwarf rush	--/--/1B.2	Known to occur in Butte, Calaveras, Placer, Sacramento, Tehama, and Yuba Counties (CNPS, 2014).	Occurs in mesic valley and foothill grassland from 98- 751 feet (CNPS, 2014).	March-May	**No.** The suitable mesic grassland habitatis not present for this species.
Juncus leiospermus var. *leiospermus* Red Bluff dwarf rush	--/--/1B.1	Known to occur in Butte, Placer, Shasta, and Tehama Counties (CNPS, 2014).	Known to occur in vernally mesic chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and in vernal pools. Elevation ranges from 115-4,101 feet (CNPS, 2014).	March-June	**No.** The Action Area is outside of the known distribution of this species.
Legenere limosa Legenere	--/--/1B.1	Known to occur in Alameda, Lake, Monterey, Napa, Placer, Sacramento, Santa Clara, Shasta, San Joaquin, San Mateo, Solano, Sonoma, Stanislaus, Tehama, and Yuba Counties (CNPS, 2014).	Occurs as part of vernal pool habitat. Elevation ranges from 3 - 2,887 feet (CNPS, 2014).	April-June	**No.** The Action Area does not contain any vernal pool habitat suitable for this species.
Lepidium latipes var. *heckardii* Heckard's pepper-grass	--/--/1B.2	Known to occur in Glenn, Merced, Sacramento, Solano, and Yolo Counties (CNPS, 2014).	Occurs in alkaline flats within valley and foothill grassland within an elevation ranging from 7-656 feet (CNPS, 2014).	March-May	**No.** Alkaline flats are not found on the Action Area.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Navarretia myersii ssp. myersii pincushion navarretia	--/--/1B.1	Known to occur in Amador, Calaveras, Merced, Placer, and Sacramento Counties (CNPS, 2014).	Occurs as part of vernal pool habitat, often in acidic soils. Elevation ranges from 66- 1,083 feet (CNPS, 2014).	April-May	**No.** The Action Area does not contain any vernal pool habitat suitable for this species.
Orcuttia tenuis Slender Orcutt grass	FT/CE/1B.1	Known from Butte, Lake, Lassen, Modoc, Plumas, Sacramento, Shasta, Siskiyou, and Tehama counties (CNPS, 2014).	Annual herb found in gravelly vernal pools from 115 –5,774 feet (CNPS, 2014).	May-October	**No.** The Action Area does not contain any vernal pool habitat suitable for this species.
Orcuttia viscida Sacramento Orcutt grass	FE/CE/1B.1	Known from Sacramento County (CNPS, 2014).	Vernal pools from 98-328 feet (CNPS, 2014).	April-September	**No.** The Action Area does not contain any vernal pool habitat suitable for this species.
Sagittaria sanfordii Sanford's arrowhead	--/--/1B.2	Known from Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Orange, Placer, Sacramento, San Bernardino, Shasta, San Joaquin, Solano, Tehama, Yuba, and Ventura Counties (CNPS, 2014).	Rhizomatous herb emergent found in assorted shallow freshwater marshes and swamps from 0- 2,133 feet (CNPS, 2014).	May-November	**No.** The suitable freshwater marsh or swamp habitat is not present for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Trifolium hydrophilum Saline clover	--/--/1B.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Monterey, Napa, Sacramento, San Benito, Santa Clara, Santa Cruz, San Joaquin, San Louis Obispo, San Mateo, Solano, Sonoma, and Yolo Counties (CNPS, 2014).	Found in marshes and swamps, mesic or alkaline valley and foothill grassland, and in vernal pools. Elevation ranges from 0-984 feet (CNPS, 2014).	April-June	**No.** The Action Area does not contain any mesic foothill grassland or vernal pool habitat suitable for this species.
Animals					
Invertebrates					
Branchinecta conservatio conservancy fairy shrimp	FE/--/--	Known from a few isolated populations distributed over a large portion of California's Central Valley and in southern California including Butte, Colusa, Glenn, Merced, Solano, Stanislaus, Tehama, Ventura, Yolo, and Yuba counties.	Ephemeral wetland habitats and vernal pools on clay, volcanic, and alluvial soils within annual grassland and pine forests. Elevations range from 16-5,577 feet.	Wet season: typically November-April (adults) Dry season: typically May-October (cysts)	**No.** The Action Area does not contain any vernal pool habitat suitable for this species.
Branchinecta lynchi vernal pool fairy shrimp	FT/--/--	Known across the Central Valley and Coast Ranges of California. Counties include Alameda, Butte, Contra Costa, Colusa, El Dorado, Fresno, Glenn, Kings, Lake, Los Angeles, Madera, Merced, Monterey, Napa, Placer, Sacramento, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Shasta, Solano, Stanislaus, Tehama, Tulare, Riverside, and Yuba. Also occurs in southern Oregon.	Ephemeral wetland habitats and vernal pools within sandstone, alkaline soils, and alluvial fan terraces, within annual grassland and pine forests. Elevations; 33-5,577 feet.	Wet season: typically December – May (adults) Dry season: typically June-November (cysts)	**No.** The Action Area does not contain any vernal pool habitat suitable for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT/--/--	Know throughout the riparian forests of the Central Valley from Redding to Bakersfield. Counties include Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Kern, Madera, Mariposa, Merced, Napa, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba.	Riparian forest communities. Exclusive host plant is elderberry (*Sambucus* species), which must have stems ≥ 1-inch diameter for the beetle. Elevations range from 0-2,500 feet.	Year round	**Yes.** The riparian corridor within the Action Area provides suitable habitat for this species.
Lepidurus packardi vernal pool tadpole shrimp	FE/--/--	Known across the Central Valley and in the San Francisco Bay area. Counties include Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Kings, Merced, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba.	Wide variety of ephemeral wetland habitats. Typically vernal pools on High Terrace landforms within annual grassland.	Wet season: typically November-April (adults) Dry season: typically May-October (cysts)	**No.** The Action Area does not contain any vernal pool habitat suitable for this species.
Fish					
Hypomesus transpacificus Delta smelt	FT/CT/--	Occurs almost exclusively in the Sacramento-San Joaquin estuary, from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties. May also occur in the San Francisco Bay.	Estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	Consult Agency	**No.** The Action Area is outside of the known distribution of this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Oncorhynchus mykiss steelhead Central Valley Steelhead	FT/--/--	Spawn in the Sacramento and San Joaquin rivers and tributaries before migrating to the Delta and Bay Area.	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	Consult Agency	**Yes.** The American River provides suitable habitat for this species within the Action Area.
Oncorhynchus tshawytscha Chinook salmon Central Valley spring-run	FT/CT/--	Spawn in the Sacramento river and some of its tributaries. Juveniles migrate from spawning grounds to the Pacific Ocean.	Spawning occurs in large deep pools in tributaries with moderate velocities and a large bubble curtain at the head.	Consult Agency	**No.** The Action Area is outside of the known distribution of this species. Upstream migration to Action Area is extremely unlikely.
Oncorhynchus tshawytscha Chinook salmon winter-run, Sacramento River	FE/CE/--	Spawn in the upper Sacramento River. Juveniles migrate from spawning grounds to the Pacific Ocean.	Returns to the Upper Sacramento River in the winter but delay spawning until spring and summer. Juveniles spend 5-9 months in the river and estuary before entering the ocean.	Consult Agency	**No.** The Action Area is outside of the known distribution of this species. Upstream migration to Action Area is extremely unlikely.
Pogonichthys macrolepidotus Sacramento splittail	--/CSC/--	Endemic to the Central Valley. Occurs below the Red Bluff Diversion Dam in Tehama County to the downstream reaches of the Sacramento and American Rivers. Also occurs in the lower reaches of the Feather, Merced, and the San Joaquin Rivers. This species is largely confined to the Delta, Suisun Bay, Suisun Marsh, Napa River, Petaluma River, and Sacramento-San Joaquin estuary.	Predominantly freshwater estuarine systems. Prefers low-salinity, shallow-water habitats. Occurs in slow-moving sections of rivers, sloughs, and marshes. Abundance is strongly tied to outflows, because spawning occurs over flooded vegetation.	Consult Agency	**No.** The Action Area is outside of the known distribution of this species. Upstream migration to Action Area is extremely unlikely.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Spirinchus thaleichthys Longfin smelt	FC/CT/--	Known to occur in Del Norte, Marin, Sonoma, and Humboldt Counties. Found in Sacramento delta/watershed and San Francisco Bay (Natureserve, 2014).	Occurs in benthic habitat within medium and large low-grade river systems. This anadromous fish spawns in areas with sandy-gravel substrates and aquatic plants. Eats crustaceans and small fishes (Natureserve, 2014).	Consult Agency	**No.** The Action Area is outside of the known range of this species. Upstream migration to Action Area is extremely unlikely.
Amphibians					
Ambystoma californiense California tiger salamander Central population	FT/CT/--	Occurs in Alameda, Butte, Contra Costa, Fresno, Glenn, Kern, Madera, Merced, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Solano, Sonoma, Stanislaus, Tulare, and Yolo counties.	Occurs in vernal pools, ephemeral wetlands, and seasonal ponds, including constructed stockponds, in grassland and oak savannah plant communities; Elevation 10-3,458 feet.	November-February (adults) March 15-May15 (larvae)	**No.** The Action Area does not contain habitat suitable for this species.
Rana aurora draytonii California red-legged frog	FT/CSC/--	Known populations from Alameda, San Francisco, Placer, Riverside, Santa Barbara, San Luis Obispo, San Mateo, Santa Cruz, Santa Clara, Marin, Sonoma, and Contra Costa Counties	Found in lowlands and foothills in or near permanent sources of deep water with dense shrubby or emergent riparian vegetation.	November – March (breeding) June - August (non-breeding)	**No.** The Action Area does not contain habitat suitable for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Spea hammondii western spadefoot toad	--/CSC/--	Known to occur from the north end of California's great central valley near Redding, south, east of the Sierras and the deserts, into northwest Baja California.	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding. Elevations range from 0-3,937 feet.	November-March	**No.** The Action Area does not contain habitat suitable for this species.
Reptiles					
Actinemys marmorata Western pond turtle	--/CSC/--	Known to occur throughout California, Oregon and Washington with some distribution in Nevada. Occurs in Sacramento County (NatureServe, 2014).	Found basking on instream debris, more commonly underwater. Prefers sandy upland habitat for breeding. Habitat includes permanent or intermittent waters of streams, medium gradient rivers, and ponds (NatureServe, 2014).	April-August (Timing varies based on location-confirm with agency)	**Yes.** The American River provides suitable habitat for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Thamnophis gigas giant garter snake	FT/CT/--	Endemic to the San Joaquin and Sacramento Valley floors. Counties include Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Madera, Merced, Sacramento, San Joaquin, Solano, Sutter, Yolo, and Yuba.	Inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands. Requires adequate water during its active season (early spring through mid-fall) to provide food and cover, emergent, herbaceous wetland vegetation for foraging and cover, grassy banks and openings in waterside vegetation for basking, and higher elevation uplands for cover and refuge from flood waters during its dormant season (winter). Inhabits small mammal burrows and other soil crevices with sunny exposure along south and west facing slopes, above prevailing flood elevations when dormant.	March-October	**No.** The Action Area does not contain habitat suitable for this species.
Birds					
Accipiter cooperii Cooper's hawk	--/WL/--	Known to occur from Siskiyou Co. south to San Diego Co; also scattered nesting in interior valleys and woodlands of Coast Range from Humboldt Co. south, and in western foothills of the Sierra Nevada	Deciduous, mixed, and evergreen forests, and deciduous stands of riparian habitat. Ranges from sea level to above 8,858 feet.	All Year	**Yes.** The riparian area along the American River provides suitable habitat for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Agelaius tricolor tricolored blackbird	--/CSC/--	Restricted to the Central Valley and surrounding foothills, throughout coastal and some inland localities in southern California, and scattered sites in Oregon, western Nevada, central Washington, and western coastal Baja California.	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	All Year	**Yes.** The American River provides suitable habitat for this species.
Ammodramus savannarum Grasshopper sparrow	--/CSC/--	Known to occur in Los Angeles, Mendocino, Orange, Placer, Sacramento, San Diego, San Louis Obispo, Solano, and Yuba Counties.	Found in clumped grassland vegetation with patches of bare ground. Requires deep litter and sparse coverage by woody vegetation. Feeds by picking up items from ground surface.	April-September	**No.** The Action Area does not contain habitat suitable for this species.
Aquila chrysaetos Golden eagle	--/FP/--	Known to occur in Alameda, Colusa, Contra Costa, El Dorado*, Fresno, Humboldt, Kern, Lake, Lassen, Los Angeles, Madera, Merced, Modoc, Mono, Monterey, Napa, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Joaquin, San Luis Obispo, Santa Clara, Siskiyou, Solano, Stanislaus, Trinity, Tulare, and Ventura Counties.	Generally open country, in prairies, arctic and alpine tundra, open wooded country, and barren areas, especially in hilly or mountainous regions.	All Year	**No.** The Action Area does not contain habitat suitable for this species.
Athene cunicularia burrowing owl	--/CSC/--	Formerly common within the described habitats throughout the state except the northwest coastal forests and high mountains.	Yearlong resident of open, dry grassland and desert habitats, as well as in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats.	All Year	**No.** The Action Area does not contain habitat suitable for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Buteo regalis Ferruginous hawk	--/WL/--	Known to occur in Alameda, Contra Costa, Imperial, Los Angeles, Merced, Monterey, Napa, Orange, Riverside, Sacramento, San Diego, San Joaquin, San Luis Obispo, Santa Barbara, Solano, and Ventura Counties.	Found in open country, primarily prairies, plains and badlands; sagebrush, saltbush-greasewood shrubland, periphery of pinyon-juniper and other woodland, desert.		**No.** The Action Area does not contain habitat suitable for this species.
Buteo swainsoni Swainson's hawk	--/CT/--	In California, breeds in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, Antelope Valley, and in eastern San Luis Obispo County.	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands, alfalfa, or grain fields supporting rodent populations.	March – October	**Yes.** The Riparian area along the American River provides suitable habitat for this species within the Action Area.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Coccyzus americanus occidentalis *Western yellow-billed cuckoo*	FT/--/--	In California, breeding populations of greater than five pairs which persist every year in California are currently limited to the Sacramento River from Red Bluff to Colusa and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. Other sites where small populations of cuckoos (<5 pairs) breed or possibly breed (but not necessarily every year) are: The Feather River from Oroville to Verona, Butte, Yuba and Sutter counties; the Prado Flood Control Basin, San Bernardino and Riverside counties; the Amargosa River near Tecopa, Inyo Co.; the Owens Valley near Lone Pine and Big Pine, Inyo Co.; the Santa Clara River near Santa Clarita, Los Angeles Co.; the Mojave River near Victorville, San Bernardino Co.; and the Colorado River from Needles, San Bernardino Co. to Yuma, Imperial Co. (Laymon and Halterman 1987).	Western yellow-billed cuckoos prefer isolated wooded riparian corridors surrounded by extensive arid uplands.	May - October	**Yes.** The Riparian area along the American River provides suitable habitat for this species within the Action Area.
Elanus leucurus white-tailed kite	--/FP/--	Permanent resident of coastal and valley lowlands.	Habitats include savanna, open woodland, marshes, partially cleared lands and cultivated fields, mostly in lowland situations. Nesting occurs in trees.	Year round	**No.** The Action Area does not contain habitat suitable for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Falco columbarius Merlin	--/WL/--	Known to occur in Butte, Fresno, Imperial, Kern, Los Angeles, Merced, Sacramento, San Benito, San Joaquin, San Luis Obispo, San Mateo, and Stanislaus counties.	Found in marshes, deserts, seacoasts, near coastal lakes and lagoons, open woodlands, and fields.	April-September	**No.** The Action Area does not contain habitat suitable for this species.
Laterallus jamaicensis coturniculus California black rail	--/CT/--	Known to occur in Alameda, Butte, Contra Costa, Imperial, Los Angeles, Marin, Napa, Nevada, Orange, Placer, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Joaquin, San Mateo, San Louis Obispo, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma, Sutter, and Yuba Counties. Also found in Arizona.	Found in herbaceous wetland including high coastal marshes with unrestricted tidal influence. Nests along marsh edges on a mat of previous year's dead grasses.	Consult agency	**No.** The Action Area does not contain habitat suitable for this species.
Melospiza melodia Song sparrow ("Modesto" population)	--/CSC/--	Known to occur in Alameda, Contra Costa, Marin, Napa, Sacramento, San Mateo, Santa Clara, Solano, Sonoma, and Stanislaus Counties.	Found in riparian or herbaceous wetland habitat among brushy, shrubby areas of grass along water courses and marshes. Nests on the ground among clumps of dead grasses or in small conifers and other shrubs.	All year	**No.** The Action Area does not contain habitat suitable for this species.
Pandion haliaetus Osprey	--/WL/--	Found throughout North and South America. Known as a "passage migrant" in the central valley of California.	Found along large to medium-sized rivers in cliffs, forested wetland, or riparian corridors. Nests are often established on the tops of large man-made structures. Ospreys eat almost exclusively fish.	Timing varies within range. Consult Agency.	**Yes.** The American River provides suitable habitat for this species within the Action Area.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Phalacrocorax auritus double-crested cormorant	--/WL/--	A yearlong resident along the entire coast of California and on inland lakes, in fresh, salt and estuarine waters.	Colonial nester on coastal cliffs, offshore islands and along lake margins in the interior of the state. Prefers water less than 30 feet deep with rocky or gravel bottom. Roosts beside water on offshore rocks, islands, steep cliffs, dead branches of trees, wharfs, jetties, or transmission lines. Perching sites must be barren of vegetation.	All Year	**No.** The Action Area does not contain habitat suitable for this species.
Progne subis Purple martin	--/CSC/--	Known from Mendocino, Napa, Sonoma, Lake, Riverside, Sacramento, San Luis Obispo, Placer, Shasta, San Diego and Monterey Counties.	Found in a variety of wooded, low-elevations habitats. Uses valley foothill and montane hardwood, valley foothill and montane hardwood-conifer, and riparian habitats. Also occurs in coniferous habitats, including closed-cone pine-cypress, ponderosa pine, Douglas-fir, and redwood. Inhabits more open areas in winter.	All Year	**Yes.** The American River provides suitable habitat for this species within the Action Area.
Riparia riparia bank swallow	--/CT/--	In California, primarily nests from Siskyou, Shasta and Lassen Counties, south along the Sacramento River to Yolo County. Also nests locally across much of state.	Found primarily in riparian and other lowland habitats west of the deserts during the spring-fall period. In summer, restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes.	April - July	**Yes.** The American River provides suitable habitat for this species within the Action Area.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Xanthocephalus xanthocephalus yellow-headed blackbird	--/CSC/--	Breeds from central British Columbia eastward to very western Ontario, southward into central California, central New Mexico, and northern Illinois. Scattered small populations further east along the Great Lakes to Ohio. Winters from southern Arizona and western Texas southward to southern Mexico. Some birds winter in California (Twedt and Crawford, 1995).	Breeds in prairie wetlands and along other western lakes and marshes where tall reeds and rushes are present. Forages in the wetlands and in surrounding grasslands and croplands. In winter large flocks forage in agricultural areas (Twedt and Crawford, 1995).	Year round	**No.** The Action Area does not contain habitat suitable for this species.
Mammals					
Antrozous pallidus pallid bat	--/CSC/--	Locally common species at low elevations. It occurs throughout California except for the high Sierra Nevada from Shasta to Kern cos., and the northwestern corner of the state from Del Norte and western Siskiyou cos. to northern Mendocino Co.	Habitats occupied include grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests, generally below 6,562 feet. The species is most common in open, dry habitats with rocky areas for roosting. Roosts also include cliffs, abandoned buildings, bird boxes, and under bridges.	All Year	**Yes.** The grasslands provide suitable habitat for this species within the Action Area.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Taxidea taxus American badger	--/CSC/--	Found throughout most of California in suitable habitat.	Suitable habitat occurs in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, parklands, and cold desert areas. Cultivated lands have been reported to provide little usable habitat for this species.	All Year	**No.** The Action Area does not contain habitat suitable for this species.

FEDERAL: United States Fish and Wildlife Service
FE Federally Endangered
FT Federally Threatened
FC Federal Candidate for Listing

STATE: California Department of Fish and Game
CE California Listed Endangered
CR California Listed Rare
CT California Listed Threatened
CSC California Species of Special Concern
CFP California Fully-Protected
WL California Watch List

CNPS: California Native Plant Society
List 1A Plants Presumed Extinct in California
List 1B Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3 Plants About Which We Need More Information- A Review List

Months in parenthesis are uncommon; Counties designated with an asterisk (*) means that the population is extirpated; Counties designated with a (*?) means that the occurrence is confirmed, but possibly extirpated.

Sources: USFWS, 2014; CDFG, 2014; CNPS, 2014; Moyle, 2002 (fish); CaliforniaHerps.com 2011 (herps).

APPENDIX B

PLANT SPECIES OBSERVED

OBSERVED PLANT CHECKLIST
American River Pipeline Conveyance Project

Plants observed on August 14 and October 1, 2014.			
FAMILY	**SCIENTIFIC NAME**	**COMMON NAME**	*****
Anacardiaceae	*Toxicodendron diversilobum*	western poison oak	N
Apiaceae	*Conium maculatum*	poison hemlock	N
Apiaceae	*Torilis arvensis*	spreading hedge parsley	I
Apocynaceae	*Asclepias sp.*	milkweed	
Apocynaceae	*Vinca major*	periwinkle	I
Araliaceae	*Hedera helix*	English ivy	I
Asteraceae	*Artemisia douglasiana*	mugwort	N
Asteraceae	*Baccharis pilularis*	coyote brush	N
Asteraceae	*Carduus pycnocephalus*	Italian thistle	I
Asteraceae	*Conyza sp.*	horseweed	
Asteraceae	*Gnaphallium sp.*	cudweed	
Asteraceae	*Hypochaeris glabra*	smooth cat's ear	I
Asteraceae	*Sonchus asper*	prickly sow thistle	I
Asteraceae	*Senecio vulgaris*	common groundsel	I
Asteraceae	*Silybum marianum*	milk thistle	I
Asteraceae	*Taraxacum officinale*	common dandelion	I
Betulaceae	*Alnus rhombifolia*	white alder	N
Boraginaceae	*Amsinckia menziesii*	fiddleneck	N
Brassicaceae	*Brassica* sp.	mustard	
Brassicaceae	*Capsella bursa-pastoris*	shepherd's-purse	I
Brassicaceae	*Hirschfeldia incana*	short-pod mustard	I
Brassicaceae	*Lepidium nitidum* var. *nitidum*	Peppergrass	N
Brassicaceae	*Raphanus sativus*	radish	I
Caprifoliaceae	*Sambucus mexicana*	Valley elderberry	N
Caryophyllaceae	*Stellaria media*	common chickweed	I
Convolvulaceae	*Convolvulus arvensis*	Field bindweed	I
Cyperaceae	*Cyperus eragrostis*	tall flatsedge	N
Cyperaceae	*Eleocharis macrostachya*	common spikerush	N
Euphorbiaceae	*Euphorbia crenulata*	common spurge	N
Fabaceae	*Medicago polymorpha*	California burclover	I
Fabaceae	*Trifolium hirtum*	rose clover	I
Fabaceae	*Trifolium variegatum*	white tipped clover	N
Fagaceae	*Quercus lobata*	valley oak	N
Fagaceae	*Quercus wislizenii*	interior live oak	N
Geraniaceae	*Erodium botrys*	long-beak storksbill	I
Geraniaceae	*Erodium cicutarium*	redstem filaree	I
Hippocastanaceae	*Aesculus californica*	buckeye	N
Moraceae	*Ficus carica*	fig	I
Pinaceae	*Pinus sabiniana*	gray pine	N
Poaceae	*Aira caryophyllea*	silver hairgrass	I
Poaceae	*Avena barbata*	slender wild oat	I
Poaceae	*Avena fatua*	Wild oat	I
Poaceae	*Briza maxima*	quaking grass	I
Poaceae	*Briza minor*	little quaking grass	I
Poaceae	*Bromus diandrus*	ripgut grass	I
Poaceae	*Bromus hordeaceus*	soft brome	I
Poaceae	*Cynodon dactylon*	Bermuda grass	I
Poaceae	*Cynosurus echinatus*	hedgehog dogtail	I
Poaceae	*Echinochloa crus-galli*	cockspur	I
Poaceae	*Elymus caput-medusae*	medusa head	I
Poaceae	*Festuca perennis*	Italian rye grass	I

OBSERVED PLANT CHECKLIST
American River Pipeline Conveyance Project

Poaceae	*Gastridium ventricosum*	nit grass	I
Poaceae	*Hordeum murinum*	foxtail	I
Poaceae	*Lolium multiflorum*	Italian ryegrass	I
Poaceae	*Polypogon monspeliensis*	rabbitsfoot grass	I
Poaceae	*Panicum acuminatum*	Western panicgrass	N
Poaceae	*Paspalum dilatatum*	Dallis grass	I
Polygonaceae	*Polygonum sp.*	knotweed	
Polygonaceae	*Rumex crispus*	curly dock	I
Ranunculaceae	*Ranunculus* sp	buttercup	
Rosaceae	*Prunus cerasifera*	wild plum	I
Rosaceae	*Rubus discolor*	himalayan blackberry	I
Rubiaceae	*Galium parisiense*	wall bedstraw	I
Salicaceae	*Populus femontii*	Fremont's cottonwood	N
Salicaceae	*Salix exigua*	sandbar willow	N
Simaroubaceae	*Ailanthus altisima*	tree of heaven	I
Urticaceae	*Urtica dioica*	stinging nettle	N
Vitaceae	*Vitus californica*	California wild grape	N

APPENDIX C

WILDLIFE SPECIES OBSERVED

OBSERVED ANIMAL CHECKLIST
American River Pipeline Conveyance Project

Animals observed on August 14 and October 1, 2014.		
Family	**Scientific Name**	**Common Name**
Birds		
Accipitridae	*Buteo jamaicensi*	Red-tailed hawk
Cathartidae	*Cathartes aura*	Turkey vulture
Corvidae	*Aphelocoma californica*	Western scrub-jay
Fringillidae	*Haemorhous mexicanus*	house finch
Icteridae	*Euphagus cyanocephalus*	Brewer's blackbird
Passeridae	*Passer domesticus*	house sparrow
Turdidae	*Sialia mexicana*	Western bluebird
Mammals		
Leporidae	*Lepus californicus*	black-tailed jackrabbit

APPENDIX D

USFWS, CNDDB, AND CNPS SCIENTIFIC DATABASE QUERIES

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad is (Carmichael (3812153) or Florin (3812144) or Sacramento East (3812154) or Elk Grove (3812143) or Sloughhouse (3812142) or Citrus Heights (3812163) or Buffalo Creek (3812152) or Folsom (3812162) or Rio Linda (3812164) or Pleasant Grove (3812174) or Roseville (3812173) or Rocklin (3812172))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S3	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S1S2	SSC
Alkali Meadow Alkali Meadow	CTT45310CA	None	None	G3	S2.1	
Alkali Seep Alkali Seep	CTT45320CA	None	None	G3	S2.1	
Ammodramus savannarum grasshopper sparrow	ABPBXA0020	None	None	G5	S2	SSC
Andrena blennospermatis Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S2	
Andrena subapasta an andrenid bee	IIHYM35210	None	None	G1G2	S1S2	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Balsamorhiza macrolepis big-scale balsamroot	PDAST11061	None	None	G2	S2	1B.2
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S2S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2	
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Chloropyron molle ssp. hispidum hispid salty bird's-beak	PDSCR0J0D1	None	None	G2T2	S2	1B.1
Clarkia biloba ssp. brandegeeae Brandegee's clarkia	PDONA05053	None	None	G4G5T4	S4	4.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Cuscuta obtusiflora var. glandulosa Peruvian dodder	PDCUS01111	None	None	G5T4T5	SH	2B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Dumontia oregonensis hairy water flea	ICBRA23010	None	None	G1G3	S1	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3	FP
Elderberry Savanna Elderberry Savanna	CTT63440CA	None	None	G2	S2.1	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Falco columbarius merlin	ABNKD06030	None	None	G5	S3	WL
Fritillaria agrestis stinkbells	PMLIL0V010	None	None	G3	S3.2	4.2
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T2	S2	1B.2
Hydrochara rickseckeri Ricksecker's water scavenger beetle	IICOL5V010	None	None	G2?	S2?	
Juglans hindsii Northern California black walnut	PDJUG02040	None	None	G1	S1	1B.1
Juncus leiospermus var. ahartii Ahart's dwarf rush	PMJUN011L1	None	None	G2T1	S1	1B.2
Juncus leiospermus var. leiospermus Red Bluff dwarf rush	PMJUN011L2	None	None	G2T2	S2	1B.1
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G4T1	S1	FP
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Lepidium latipes var. heckardii Heckard's pepper-grass	PDBRA1M0K1	None	None	G4T2	S2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G3	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Melospiza melodia song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
Navarretia myersii ssp. myersii pincushion navarretia	PDPLM0C0X1	None	None	G1T1	S1	1B.1
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Northern Volcanic Mud Flow Vernal Pool Northern Volcanic Mud Flow Vernal Pool	CTT44132CA	None	None	G1	S1.1	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S3	
Oncorhynchus mykiss irideus steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2	S2	
Orcuttia tenuis slender Orcutt grass	PMPOA4G050	Threatened	Endangered	G2	S2	1B.1
Orcuttia viscida Sacramento Orcutt grass	PMPOA4G070	Endangered	Endangered	G1	S1	1B.1
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S3	WL
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S3	WL
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G2	S2	SSC
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2S3	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Thamnophis gigas giant garter snake	ARADB36150	Threatened	Threatened	G2	S2	
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Valley Needlegrass Grassland						
Xanthocephalus xanthocephalus	ABPBXB3010	None	None	G5	S3	SSC
yellow-headed blackbird						

Record Count: 63

Plant List

14 matches found. Click on scientific name for details

Search Criteria

Found in 9 Quads around 38121F3

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	1B.2	S2	G2
Chloropyron molle ssp. hispidum	hispid bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	1B.1	S2	G2T2
Clarkia biloba ssp. brandegeeae	Brandegee's clarkia	Onagraceae	annual herb	4.2	S4	G4G5T4
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	2B.2	S2	GU
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G3
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	1B.2	S2	G2
Juncus leiospermus var. ahartii	Ahart's dwarf rush	Juncaceae	annual herb	1B.2	S1	G2T1
Juncus leiospermus var. leiospermus	Red Bluff dwarf rush	Juncaceae	annual herb	1B.1	S2	G2T2
Legenere limosa	legenere	Campanulaceae	annual herb	1B.1	S2	G2
Navarretia myersii ssp. myersii	pincushion navarretia	Polemoniaceae	annual herb	1B.1	S1	G1T1
Navarretia nigelliformis ssp. nigelliformis	adobe navarretia	Polemoniaceae	annual herb	4.2	S3.2	G4T3
Orcuttia tenuis	slender Orcutt grass	Poaceae	annual herb	1B.1	S2	G2
Orcuttia viscida	Sacramento Orcutt grass	Poaceae	annual herb	1B.1	S1	G1
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb	1B.2	S3	G3

Suggested Citation

CNPS, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 06 August 2014].

Plant List

18 matches found. Click on scientific name for details

Search Criteria

Found in 9 Quads around 38121E3

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	4.2	S3.2	G3T3
Clarkia biloba ssp. brandegeeae	Brandegee's clarkia	Onagraceae	annual herb	4.2	S4	G4G5T4
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	Convolvulaceae	annual vine (parasitic)	2B.2	SH	G5T4T5
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	2B.2	S2	GU
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G3
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	1B.2	S2	G2
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	4.2	S3.2	G3
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb	1B.2	S2	G5T2
Juglans hindsii	Northern California black walnut	Juglandaceae	perennial deciduous tree	1B.1	S1	G1
Juncus leiospermus var. ahartii	Ahart's dwarf rush	Juncaceae	annual herb	1B.2	S1	G2T1
Legenere limosa	legenere	Campanulaceae	annual herb	1B.1	S2	G2
Lepidium latipes var. heckardii	Heckard's pepper-grass	Brassicaceae	annual herb	1B.2	S2	G4T2
Navarretia eriocephala	hoary navarretia	Polemoniaceae	annual herb	4.3	S3.3	G3
Navarretia myersii ssp. myersii	pincushion navarretia	Polemoniaceae	annual herb	1B.1	S1	G1T1
Orcuttia tenuis	slender Orcutt grass	Poaceae	annual herb	1B.1	S2	G2
Orcuttia viscida	Sacramento Orcutt grass	Poaceae	annual herb	1B.1	S1	G1
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb	1B.2	S3	G3
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	1B.2	S2	G2

Suggested Citation

CNPS, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 06 August 2014].

U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in
or may be Affected by Projects in the
CARMICHAEL (512D)
U.S.G.S. 7 1/2 Minute Quad

Report Date: August 6, 2014

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Branchinecta lynchi
Critical habitat, vernal pool fairy shrimp (X)
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
Critical habitat, valley elderberry longhorn beetle (X)
valley elderberry longhorn beetle (T)

Lepidurus packardi
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas

giant garter snake (T)

Plants

Orcuttia tenuis

Critical habitat, slender Orcutt grass (X)

slender Orcutt grass (T)

Orcuttia viscida

Critical habitat, Sacramento Orcutt grass (X)

Sacramento Orcutt grass (E)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in
or may be Affected by Projects in the
CITRUS HEIGHTS (512A)
U.S.G.S. 7 1/2 Minute Quad

Report Date: August 6, 2014

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
Critical habitat, valley elderberry longhorn beetle (X)
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Key:

- (E) Endangered - Listed as being in danger of extinction.
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- (X) Critical Habitat designated for this species

APPENDIX C

GEOTECHNICAL REPORT

GEOTECHNICAL INTERPRETIVE REPORT
PROPOSED CARMICHAEL WATER DISTRICT
CONVEYANCE PIPELINE PROJECT
SACRAMENTO COUNTY, CALIFORNIA

July 2, 2014

July 2, 2014
File No. 201434001.001A

Mr. Alex R. Peterson, P.E.
Principal, Project Manager
Kennedy/Jenks Consultants
10850 Gold Center Drive, Suite 350
Rancho Cordova, CA 95670

Subject: Geotechnical Interpretive Report
Proposed Carmichael Water District
Conveyance Pipeline Project
Sacramento County, California

Dear Mr. Peterson:

Kleinfelder is pleased to present the attached geotechnical interpretive report for the proposed Carmichael Water District (CWD) conveyance pipeline project crossing the American River Parkway between the existing Bajamont Way Water Treatment Plant (WTP) on the north side of the river and Rossmoor Drive on the south side. The project consists of approximately 1.5 miles of 24-inch-diameter water pipeline. The river crossing portion will be performed using horizontal directional drilling (HDD). The rest of the pipeline will be installed using open cut methods.

The purpose of our investigation was to explore and evaluate the subsurface conditions at various locations on the site in order to develop geotechnical engineering recommendations for project design and construction. Based on the results of our field investigation and laboratory testing programs, it is our professional opinion that the proposed pipeline project is feasible using open cut and HDD pipeline installation methods. Information regarding site geology and the subsurface conditions encountered during our field explorations are presented in the accompanying Geotechnical Data Report (GDR) dated July 2, 2014.

The geotechnical conditions at the site include coarse gravel with cobbles and boulders including dredge tailings on the south side of the active American River channel. These materials will affect the approach to trench excavation and shoring. In addition, the majority of the excavated materials south of the active river channel are not expected to meet typical engineered fill criteria without screening or crushing to a maximum particle size of 3 inches. Beneath the gravels on the south side of the active river channel, and on the north side, relatively stiff/dense lean clays, silts and sands exist that appear favorable for HDD and open cut construction. Specific recommendations and general recommendations addressing the geotechnical aspects of project design and construction are presented in the following report.

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Recommendations provided herein are contingent on the provisions outlined in the Additional Services and Limitations sections of this report. The project Owner should become familiar with these provisions in order to assess further involvement by Kleinfelder and other potential impacts to the proposed project.

We appreciate the opportunity of providing our services for this project. If you have questions regarding this report or if we may be of further assistance, please contact the undersigned.

Sincerely,

KLEINFELDER, INC.

Steven Wiesner, PE, GE
Project Geotechnical Engineer

Kenneth G. Sorensen, PE, GE
Principal Geotechnical Engineer

SW:KGS:aak

KLEINFELDER 3077 Fite Circle; Sacramento, CA 95827-1815 **p** | 916.366-1701 **f** | 916.366-7013

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GEOTECHNICAL INTERPRETIVE REPORT
PROPOSED CARMICHAEL WATER DISTRICT
CONVEYANCE PIPELINE PROJECT
SACRAMENTO COUNTY, CALIFORNIA

1 INTRODUCTION

1.1 GENERAL

Kleinfelder is pleased to present the attached geotechnical interpretive report for the proposed Carmichael Water District (CWD) conveyance pipeline project crossing the American River Parkway between the existing Bajamont Way Water Treatment Plant (WTP) on the north side of the river and Rossmoor Drive on the south side. The project alignment is within the Carmichael and Rancho Cordova areas of Sacramento County, California. The site location relative to existing streets is shown on Plate 1. Geotechnical data for this project is included in the accompanying Geotechnical Data Report (GDR) dated July 2, 2014.

This report includes our recommendations related to the geotechnical aspects of project design and construction. Conclusions and recommendations presented in this report are based on the subsurface conditions encountered at the locations of our explorations and the provisions and requirements outlined in the Additional Services and Limitations sections of this report. Recommendations presented herein should not be extrapolated to other areas or used for other projects without our prior review.

1.2 PROPOSED CONSTRUCTION

This project includes the construction of a pipeline connecting the Bajamont Way WTP existing facilities with Golden State Water Company's (GSWC) service area in Rancho Cordova. The subject water main pipeline will be about 1.5 miles in length and extend from CWD's existing Bajamont WTP on the north side of the American River Parkway to a proposed tie-in point at an existing water main located along Coloma Road near Rossmoor Drive.

The pipeline will be 24-inches in inside diameter. The open cut portions of the pipeline will have a depth of cover of about 5 feet and be constructed using ductile iron pipe. The proposed American River crossing segment will be performed under the active river channel using horizontal directional drilling (HDD) methods and high density polyethylene (HDPE) pipe.

The north tie-in point for the new pipeline will be at the existing 24-inch-diameter transmission main located about 150 feet south of the Bajamont WTP. This tie-in point is located near the outlet of an unnamed tributary stream channel in a small canyon that has been filled near its mouth to form the Bajamont WTP river access road. The unnamed tributary stream channel is drained by a 24-inch-diameter culvert. This culvert outlets to the American River and will need to be removed and reconstructed to facilitate the new pipeline and tie-in. The reconstruction of the culvert will include filling erosion gullies and re-grading the existing slopes above the river to reduce erosion potential during storms and improve the habitat continuity that exists in other areas of the American River Parkway. The project also includes removal of an abandoned, existing 33-inch-diameter river crossing pipeline that terminates near the proposed new tie-in. Stabilization and re-vegetation of the disturbed areas following construction will be needed.

1.3 PREVIOUS INVESTIGATION

Kleinfelder previously provided geotechnical services for the expansion of the Bajamont Way WTP in 1996 through 1998. The expansion included new facilities at the WTP and a new Ranney well collector system currently in place near the proposed river crossing alignment. A pipeline was installed beneath the river to connect the Ranney well system with the WTP. That pipeline was installed by microtunneling beneath the river channel just upstream of the proposed crossing alignment. Borings drilled for that study appear applicable to this project. Logs of borings drilled for that investigation were reviewed and are included in Appendix C of the GDR. Logs of these small diameter borings indicate gravel layers in the active river channel and south bank but in some cases do not describe the sizes of cobbles and boulders that exist in those materials, since the drilling method used did not permit such evaluation. For the purposes of this report, those gravel units depicted on the logs of borings from Kleinfelder (1998) should be assumed to have abundant cobbles and small boulders similar to the samples recovered from the test pits within Rossmoor Bar Park. Laboratory sieve analysis test

results on test pit samples collected during this study that are considered typical of these gravel formations are included in Appendix B of the GDR.

1.4 PURPOSE AND SCOPE OF SERVICES

The purpose of our investigation was to explore and evaluate the subsurface conditions at various locations along the pipeline alignment in order to develop geotechnical recommendations for project design and construction. The scope of our services was outlined in our proposal dated January 14, 2014and included the following:

- A review of available subsurface information provided by others and contained in our files pertinent to the proposed construction and project site
- Exploration of the subsurface conditions at various locations within the area of the proposed construction utilizing drilled borings and test pits
- Limited laboratory testing of representative samples obtained during the field investigation to evaluate in-situ parameters of the subsurface soils
- Engineering analyses on which to base our recommendations for the design and construction of the geotechnical aspects of the project
- Preparation of this report which includes:
    - A description of the proposed project
    - A summary of the field investigation and laboratory testing programs
    - A description of the surface and subsurface conditions encountered during our field investigation
    - A description of the site geologic setting and possible, associated geology related hazards
    - A brief discussion of the corrosion potential of the near-surface soils encountered during our previous field explorations based on laboratory corrosivity tests performed by others. (NOTE: Kleinfelder's scope does not include corrosion engineering and, therefore, detailed analysis of corrosion test results is not included).
    - Recommendations related to the geotechnical aspects of:
        - Site preparation, grading, and trench backfill
        - Temporary excavations and shoring
        - Pipeline design criteria
        - HDD design and construction considerations
        - California Building Code (CBC) seismic design parameters for use in structural analysis
    - Appendices that include logs of borings and test pits and laboratory test results

- An appendix that includes relevant subsurface information from our previous geotechnical study in the site area

This report includes conclusions and recommendations for project design and construction. The geotechnical and geologic data gathered is presented in the GDR.

2 CONCLUSIONS AND RECOMMENDATIONS

2.1 GENERAL

This section provides conclusions and recommendations regarding the open cut trenching and trenchless portions of the proposed pipeline as well as general earthwork to be performed in the small unnamed canyon just east of Landis Avenue that will include temporary cut slopes, removal of the existing culvert near the outlet of the canyon, re-placement of temporary cuts with new engineered fills, and related remedial grading in that area. The present pipeline alignment includes a trenchless crossing of the American River near Rossmoor Bar and the existing CWD Bajamont WTP, as well as open cut trench construction along the Rossmoor Drive alignment south of the river crossing, and a portion between the CWD plant and the north end of the trenchless river crossing.

2.2 LIQUEFACTION AND DYNAMIC SETTLEMENT

The principal effects of earthquakes on consolidated soil deposits are strong shaking, liquefaction, and dynamic settlement. Liquefaction describes a condition in which saturated soil loses shear strength and mobilizes as a result of increased pore pressure induced by strong ground shaking during an earthquake. The principal effects of liquefaction on pipelines and structures are the settlement (both total and differential), loss of foundation support, and for buried structures or pipelines to rise buoyantly. Soils most susceptible to liquefaction are saturated, loose sandy soils and some silts. The potential for an earthquake with the intensity and duration characteristics capable of promoting liquefaction is a possibility during the design life of the project. However, given the relatively dense/hard nature of the soils underlying the site combined with the lack of groundwater within the upper sand and gravel layers during average river flow conditions (not peak river stage), the potential for liquefaction is considered to be low in the open cut reaches of the proposed pipeline south of the American River but moderate to high in the sandy soils nearest the south bank. In addition, the potential for dynamic settlement in existing near-surface sand and gravel soils south of the American River is low to moderate based on the conditions encountered along the proposed alignment. Based on preliminary drawings of the proposed HDD bore path under the

active American River channel, it appears the pipeline will be below the soils most susceptible to liquefaction that exist along the south bank.

2.3 SITE PREPARATION AND EARTHWORK

2.3.1 General

The following recommendations are applicable to general site grading, pipeline trench excavation and backfill. Al references to relative compaction in this report are based on the American Society for Testing and Materials (ASTM) Test Method D 1557.

2.3.2 Existing Pavements

We anticipate existing pavements within the areas of the proposed pipeline trench will be demolished and removed from the site. Depending on the contractor's capabilities, and other factors, it may be possible (and desirable) to process on-site pavements for reuse as engineered fill and/or aggregate subbase. Processing could involve pulverization, grinding, or other means. Regardless of the method used, for this material to be utilized as engineered fill and/or aggregate subbase, it must be thoroughly pulverized to provide a well-graded material with a maximum particle size of 3 inches.

2.3.3 Stripping and Grubbing

Prior to general site grading, existing vegetation, organic topsoil, and any debris should be stripped and disposed of outside the construction limits. We estimate the depth of stripping to be approximately 1 to 3 inches in vegetated areas of the site. Deeper stripping or grubbing may be required where concentrations of organic soils or tree roots are encountered during site grading. Stripped topsoil (less any debris) may be stockpiled and reused for landscape purposes. However, this material should not be incorporated into any engineered fill.

2.3.4 Existing Utilities, Wells, and/or Foundations

Although not encountered during our field investigation, it is possible abandoned utility lines, septic tanks, cesspools, wells, and/or foundations may exist on site. If

encountered within the area of construction, these items should be removed and disposed of off-site; existing wells should be abandoned in accordance with applicable regulatory requirements. Existing utility pipelines that extend beyond the limits of the proposed construction and that are to be abandoned in-place should be plugged with cement grout to prevent migration of soil and/or water. All excavations resulting from removal activities should be cleaned of loose or disturbed material (including all previously-placed backfill) and dish-shaped (with sides sloped 3H:1V or flatter) to permit access for compaction equipment.

2.3.5 Scarification and Compaction

Following site stripping and any required grubbing and/or over-excavation, all areas to receive engineered fill or to be used for the future support of structures should be scarified to a depth of 8 inches, uniformly moisture-conditioned to between 2 and 5 percent above the optimum moisture content, and compacted to at least 90 percent relative compaction. Within pavement areas the scarified subgrade should be compacted to at least 95 percent relative compaction. Scarification and compaction may not be required within earthwork cut areas consisting of cemented soils if approved by the project Geotechnical Engineer during construction.

In-place scarification and compaction may not be adequate to densify all disturbed soil within areas grubbed or otherwise disturbed below a depth of about 8 inches. Therefore, over-excavation of disturbed soil, scarification and compaction of the exposed subgrade, and replacement with engineered fill may be required to sufficiently densify all disturbed soil.

Should site grading be performed during or subsequent to wet weather, near-surface site soils may be significantly above optimum moisture content. Additionally, it is common to encounter wet, unstable soils upon removal of site pavements or flatwork as a result of subsurface moisture becoming trapped beneath relatively impervious asphalt concrete or portland cement concrete surfaces. Perched groundwater may also develop above dense, cemented on-site soils, saturating near-surface materials. These conditions could hamper equipment maneuverability and efforts to compact site soils to the recommended compaction criteria. Disking to aerate, chemical treatment, replacement with drier material, stabilization with a geotextile fabric or grid, or other methods may be required to reduce excessive soil moisture and facilitate earthwork

operations. Our firm should be consulted prior to implementing any remedial measure to observe the unstable subgrade condition and provide site specific recommendations.

2.4 TEMPORARY EXCAVATIONS

2.4.1 Excavations and Slopes

All excavations must comply with applicable local, state, and federal safety regulations including the current OSHA Excavation and Trench Safety Standards. Construction site safety is the sole responsibility of the Contractor who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing the information below solely as a service to our client. Under no circumstances should the information provided be interpreted to mean that Kleinfelder is assuming responsibility for construction site safety or the Contractor's activities. Such responsibility is not being implied and should not be inferred.

The predominant soil conditions encountered along the alignment may be divided into three general categories. Table 2.1, below, describes our estimates of trench side slope configurations for each major soil type in level ground conditions along with the corresponding OSHA categories. This information should be used for project planning/layout purposes only. The actual slope inclinations for unshored excavations will vary depending on factors such as the presence of cohesionless soils along the slope face, presence of groundwater, and surcharge loading (construction equipment, pipe, excavated soil, etc.) adjacent to the excavation. Actual trench side slopes should be evaluated by qualified personnel during construction.

Table 2.1
Guideline Trench Side Slope Configurations

Material Type	OSHA Category	Inclination
Very stiff to hard fine-grained alluvial soils (CL, ML) and some very dense and cemented, silty and clayey sands (SM, SC)	Type A	0.75(h) to 1(v)
Medium stiff or medium dense fine and coarse grained soils including sands, gravels, and cobbles with some fine-grained soil matrix (ML, CL, SM, SC, GM, GC)	Type B	1(h) to 1(v)
Relatively "clean" sands, gravels, and cobbles (SP, SW, GP, GW) including dredge tailings	Type C	1.5(h)to 1(v)

It is anticipated that vertical and/or combined vertical and sloping trenches will be used for this project. Shoring of the lower or vertical portions of the trenches is anticipated to be necessary in some cases. Sandy soils classified as SP or SW and gravelly soils classified as GP or GW are generally susceptible to caving in near-vertical open excavations, especially as they are allowed to dry out, and will likely require shoring. With exposure and drying, trench wall materials may experience progressive sloughing if excavated near vertical and left unshored during pipe placement and backfilling. Accordingly, the Contractor should be aware that slope height and inclinations should in no case exceed those specified in local, state, and/or federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations).

All surface runoff or overland flows should be diverted by earthen berms or other methods to prevent water from entering the excavations. All runoff water and/or groundwater encountered within the excavation(s) should be collected and disposed of outside the construction limits.

Heavy construction equipment, construction materials, excavated soil, and vehicular traffic should not be allowed within 1/3 the slope height from the top of any unshored excavation. Where the stability of adjoining buildings, walls, pavements, or other improvements is endangered by excavation operations, support systems such as shoring, bracing, or underpinning may be required to provide structural stability and to

protect personnel working within the excavation. Shoring, bracing, or underpinning required for the project (if any) should be designed by a professional engineer registered in the State of California. If soft trench bottom conditions are encountered during construction, the shoring designer should evaluate whether the effects of soft trench bottom will affect the performance of the shoring system.

2.4.2 Existing Utility and Culvert Crossings

Utility crossings are likely present along the proposed pipeline alignment. Temporary support for these facilities is anticipated to be necessary where they are in close proximity or within proposed pipeline excavations. Backfill materials around various existing utilities are anticipated to vary from cohesionless sands and gravels around the installations to local soils. Existing utility trench backfills may cave or collapse upon exposure in open excavations and/or potentially undermine the utility. In addition, existing utility trenches in close proximity and running parallel to excavations may also be subject to collapse if left unsupported. The Contractor should be aware of such conditions when evaluating excavation slope stability and provide support as required

2.5 ANTICIPATED TRENCH EXCAVATION CONDITIONS

2.5.1 Trench Excavation Characteristics

Excavations for the proposed pipeline are anticipated to be possible using conventional, moderate to large-sized track-mounted excavators equipped to excavate in weakly to moderately cemented, fine-grained soils and dense gravel with cobbles and small boulders. The gravel layers contain abundant cobbles from 3 to 12 inches in maximum dimension and occasional small boulders up to about 24 inches in maximum dimension. Some of the gravel deposits are recent stream channel deposits. However, in several areas, the river gravels have been dredge mined for gold and the various materials have been sorted during that process.

Excavations into these coarse-grained gravel, cobble, and boulder formations are expected to be marginally difficult based on the extent of large cobbles and the relative density of the formation. Some caving of these gravel and cobble layers in open excavations may result, especially where fine-grained interstitial soils are lacking, as in the dredge tailings.

Depending on the depth of excavation below groundwater, soil conditions encountered along the excavation face, and slope inclination, caving or sloughing of excavation slopes is likely within the vicinity of seepage areas. Sloughing or caving of excavation slopes could endanger personnel working within or adjacent to the excavation as well as nearby equipment, structures, or other existing improvements. The Contractor should be aware of the potential for caving and take appropriate precautions to ensure the safety of site personnel as well as the integrity of the excavation slopes and any existing nearby structures or other improvements.

2.5.2 Trench Wall Stability

Our experience with similar shallow trench excavation projects in fine-grained alluvial materials in the area is that trench sidewalls can remain in a near vertical orientation for minutes to hours until positive sidewall shoring/support can be installed. However, this may not be valid in areas that transmit groundwater and where relatively clean, coarse-grained soils are present and/or the excavation sidewall is surcharge loaded with equipment or excavated soil. In all cases, the Contractor should select an excavation, dewatering, and/or shoring scheme that will protect adjacent improvements including buried utilities.

2.5.3 Trench Bottom Heaving and Instability

The soils encountered near the proposed trench bottom depths generally appear to be relatively firm/dense and capable of providing support for the pipeline and ancillary structures. Based on our present knowledge of the proposed construction, the risk of trench bottom heave and instability is expected to be low.

2.5.4 Soil Moisture Content

Based on our field measurements and previous experience, we expect the on-site soils will require some wetting or drying and mixing to achieve the proper moisture content for compaction. Processing will likely require staging areas to moisture condition and mix the excavated materials. We recommend consideration be given to potential soil processing areas prior to construction. Consideration should also be given to weather

conditions at the time of grading since wet weather and soil conditions may hinder construction efforts.

2.6 SHORING

2.6.1 General

Shoring may be required where space or other restrictions do not allow a sloped excavation. Sheet piles are anticipated to encounter driving difficulty in areas underlain by cemented soils, and coarse-grained gravel and cobble materials.

If soldier piles are to be used, continuous lagging will be required to retain potentially caving cohesionless materials. Since selection of appropriate shoring systems will be dependent on construction methods and scheduling, we recommend the Contractor be solely responsible for the design, installation, maintenance, and performance of temporary shoring systems.

If bucket augers are proposed for installation of soldier piles for earth retention, the Contractor should be aware that cobbles and boulders up to about 24 inches in maximum dimension have been encountered along the alignment. Based on our previous experience, flight augers smaller than about 24 inches in diameter are not recommended, and 30- to 36-inch- diameter augers have been better able to penetrate the coarse gravel and cobble materials.

Discontinuous shoring systems may not be suitable in cohesionless soils such as sands, gravels and cobbles. Continuous shoring systems such as Slide Rail, trench boxes, or other applicable shoring systems may be suitable provided Cal OSHA regulations are met.

Where positive restraint of trench walls is not provided, as with trench shields and similar systems, the trench walls may yield resulting in cracking of adjacent pavement sections and or lateral movement of adjacent buried utilities. The potential for this condition is expected to increase with trench depth. Consideration should be given to the appropriate type of shoring required to prevent damage to adjacent structures, pavements, and/or buried utilities. Positive restraint shoring is recommended in these areas.

2.6.2 Lateral Deflections

Lateral deflection of a shored excavation will depend on the relative stiffness of the shoring system selected and mobilization of the active earth pressure. The limiting condition of maximum active earth pressure for stiff to hard silts and clays is generally reached when the shoring tilts or deflects laterally about 1 percent of the shoring wall height. The limiting condition of active earth pressure for medium dense to dense sands and gravels is generally reached when the shoring tilts or deflects laterally about 0.2 percent of the shoring wall height. If the shoring tilts or deflects less than the limiting condition, the lateral earth pressure will lie between the active and at-rest earth pressures. This soil movement can extend horizontally from 1H to 2H back from the top of cantilever retaining structures, with vertical movements approximately equal to the horizontal. The movement tends to be greatest close to the excavation and becomes less with increasing distance away. Backfilling void spaces behind shoring with sand or pea gravel may reduce the potential for vertical and lateral movements around the shored excavation.

The shoring designer should perform a deflection analysis of the shoring system. If movements are greater than the tolerance of existing project features (utilities, pavements, structures, etc.) tie-backs, dead-man anchors, or cross bracing may be needed to reduce deflections. Design using the at-rest pressure and/or more stringent tie-back or bracing systems may be required in the vicinity of improvements that cannot withstand lateral movements.

2.6.3 Lateral Resistance

All soldier piles should extend to a sufficient depth below the excavation bottom to provide the required lateral resistance. Embedment depths should be determined using methods based on the principles of force and moment equilibrium. To account for three-dimensional effects, the passive pressure may be assumed to act on an area 2 times the width of the embedded portion of the pile, provided adjacent piles are spaced at least 3 diameters, center-to-center. A minimum factor of safety of 1.2 should be applied to the calculated embedment depth and to determine the allowable passive pressure. The shoring professional should evaluate the final design conditions and shoring type to select the appropriate factor of safety for design.

The passive earth pressure, similar to active earth pressures, is mobilized when the shoring below the excavation bottom tilts or deflects laterally. For stiff silt and clay conditions, the limiting condition of maximum passive earth pressure is generally reached when the shoring deflects laterally below the base of the excavation about 2 percent of the shoring wall height. In softer materials this value may approach 6 percent. For dense sand and gravel conditions, the limiting condition of maximum passive earth pressure is generally reached when the shoring deflects laterally below the base of the excavation about 2 percent of the shoring wall height. If the shoring system is restrained against movement, the lateral resistance below the base of the excavation will lie somewhere between the passive and at-rest earth pressure conditions. Accordingly, if lateral deflection at the base of the excavation is objectionable, the at-rest earth pressure should be used in design for lateral resistance.

2.6.4 Surcharge Pressures

Shoring systems should be designed to resist lateral pressures due to hydrostatic forces, if present, and surface loads adjacent to excavations. We anticipate surface loads will be imposed by construction equipment, foundations, railroads, roadways, etc.

2.6.5 Existing Utilities and Pavements

The shoring designer should complete a survey of existing utilities, pavements, and structures adjacent to those portions of the proposed excavation that will be shored. The purpose of this review would be to evaluate the ability of existing pipelines or conduits to withstand horizontal movements associated with a shored excavation. If existing utilities, pavements, and structures are not capable of withstanding anticipated lateral movements, alternative shoring systems may be required. It may be necessary to The Owner or Contractor should anticipate repairing repair cracks in pavements adjacent to shored portions of the excavations due to anticipated lateral displacements of the shoring systems.

2.6.6 Existing Trench Backfill Conditions

In areas where existing trench backfills are exposed in or located adjacent to excavations for the proposed interceptor improvements, the guideline trench side slope

and shoring design criteria presented above may not be valid. The shoring designer should consider the presence of existing utility trenches in and near the proposed excavation areas as well as methods to protect the utilities. If existing trench backfill materials are encountered in excavations on the site, the shoring designer should be notified immediately to observe and address the encountered conditions. It should be noted that trench wall collapses have occurred where these conditions were not recognized and addressed during construction.

2.6.7 Monitoring

Horizontal and vertical movements of the shoring system in developed areas should be monitored by establishing survey points, installation of inclinometers, or a combination of both prior to excavation. The results should be reviewed by a qualified Geotechnical Engineer on a daily basis for a period of at least one week during excavation and following construction of the shoring system. Measurements should be obtained on a weekly basis thereafter. Detailed recommendations for monitoring should be provided by a qualified Geotechnical Engineer after a review of the planned shoring system.

2.6.8 Construction Vibrations

The Contractor should use means and methods that will limit vibrations of adjacent structures/facilities. As a guide, construction vibrations within adjacent structures/facilities should be limited to less than about 0.5 inch/second when measured using an accelerometer. More stringent requirements may be needed adjacent to either historic structures or buildings in poor condition.

2.6.9 Shoring Removal

Shoring systems typically are removed as part of the trench backfill process. Depending on the shoring system used, the removal process may create voids along the sides of the trench excavation. If these voids are left in place and are significantly large, backfill may shift laterally into the voids resulting in settlement of the backfill and overlying improvements. Therefore, care should be taken to remove the shoring system and backfill the trench in such a way as to not create these voids. If the shoring system requires removal after backfill is in place, resulting voids should be filled with cement slurry or grout.

2.7 TRENCH SUBGRADE AND BACKFILL

2.7.1 Subgrade Preparation

The materials encountered near the proposed pipeline depths appear suitable for direct support of the pipeline and any ancillary structures. To mitigate the potential for excessive settlement beneath the pipe, the subgrade materials should be in a firm and unyielding condition. Prior to placement of bedding, the exposed subgrade at the base of the trench excavation should be examined to detect soft, loose, or unstable areas. Loose materials at trench bottoms resulting from excavation disturbance should be removed to firm soil. If soft, loose, or unstable subgrade areas are encountered, these areas should be over-excavated to firm soil and be replaced with additional bedding material.

2.7.2 Pipe Bedding and Pipe Zone Backfill Placement

It is understood that pipe bedding and pipe zone backfill material will consist of Caltrans Class 2 aggregate base material. The material should be moisture conditioned to slightly above the optimum moisture content, be placed in loose lifts less than 8 inches in thickness, and mechanically compacted to at least 90 percent relative compaction. Pipe zone backfill materials around the pipe zone should be placed in a manner to eliminate voids beneath the pipe. Shovel slicing is recommended under the pipe haunches.

2.7.3 Trench Backfill

We anticipate that some of the excavated on-site earth materials will contain localized concentrations of cobbles and boulders in excess of 3 inches in maximum dimension. In order to use this material for intermediate trench backfill (i.e., material placed above the initial backfill), excavated, on-site materials containing over-sized rock should either be: (1) crushed to reduce individual rock pieces to less than 3 inches in maximum dimension; or (2) screened, raked, or selectively processed to remove oversize material in excess of 3 inches in maximum dimension. All rock in excess of 3 inches in maximum dimension removed from the fill should be disposed of outside the construction limits. All imported fill soils should meet the requirements for engineered

fill presented in Section 2.8, Engineered Fill and Trench Backfill. In addition, all trench backfill materials should be placed and compacted as recommended therein.

2.8 ENGINEERED FILL AND TRENCH BACKFILL

2.8.1 Materials

The on-site lean clays, and silty and clayey sands on the north side of the American River appear suitable for use as engineered fill and trench backfill. The gravels with cobbles and boulders located south of the active river channel could be used for engineered fill or trench backfill provided they are processed meet maximum particle size criteria presented below.

All imported engineered fill soils should be nearly-free of organic materials, debris, or other unsuitable materials, be essentially non-plastic, and have a maximum particle size less than 3 inches in maximum dimension. In general, well-graded mixtures of gravel, sand, non-plastic silt, and small quantities of clay are acceptable for use as engineered fill. Specific requirements for engineered fill, as well as applicable test procedures to verify material suitability, are provided in Table 2.2 below.

Table 5.2
Imported Engineered Fill and Trench Backfill

		Test Procedures	
Fill Requirement		**ASTM[1]**	**Caltrans[2]**
Gradation			
Sieve Size	**Percent Passing**		
3 inch	100	C 136	202
¾ inch	70-100	C 136	202
No. 4	30-100	C 136	202
No. 200	10-85	C 136	202
Plasticity			
Liquid Limit	**Plasticity Index**		
<40	<15	D 4318	204
Organic Content			
No visible organics			

[1]American Society for Testing and Materials Standards (latest edition)
[2]State of California, Department of Transportation, Standard Test Methods (latest edition)

All imported fill materials to be used for engineered fill should be sampled and tested by the project Geotechnical Engineer prior to being transported to the site.

2.8.2 Compaction Criteria

Soils used for engineered fill and trench backfill should be uniformly moisture-conditioned to between 2 and 5 percent above the optimum moisture content, and compacted to at least 90 percent relative compaction. The upper twelve inches of pavement subgrades should be compacted to at least 95 percent relative compaction at a moisture content slightly above optimum.

Additional fill lifts should not be placed if the previous lift did not meet the required relative compaction or if soil conditions are not stable. Wetting or drying of the excavated materials is anticipated to be necessary to obtain the proper moisture content for compaction. Mixing and/or blending may be required to uniformly moisture condition

soils used for engineered fill. Ponding or jetting compaction methods should not be allowed as a sole means of compaction.

2.9 PERMANENT SLOPES

Fill slopes are anticipated to be constructed on the northern end of the pipeline in the unnamed small canyon area following completion of the trenchless river crossing and abandonment of the existing culvert. Fill slopes should be composed of properly placed and compacted engineered fill and should be constructed at a gradient no steeper than 2H:1V. Fill slopes should be overbuilt and trimmed back into compacted material. Slopes exceeding 30 feet in vertical height should include at least one terrace as outlined in the 2013 California Building Code (CBC).

2.9.1 Key and Bench Requirements

Fill placed on existing fill or natural slopes steeper than 5H:1V should be keyed and benched into the existing slope. In general, keyways should extend into firm, undisturbed soil, be a minimum of 8 feet wide, 2 to 4 feet deep (below existing site grade), and extend the full length of the slope. A typical key and bench detail is shown on Plate 3.

2.9.2 Erosion Control

To reduce the potential for surface erosion, all cut and fill slopes should be vegetated with deep-rooted perennial grasses or other appropriate erosion control measures. To further reduce the potential for surface erosion, a berm or "V" ditch may be located at the top of slopes subject to significant overland water flows in order to intercept and redirect surface runoff.

2.9.3 Subsurface Seepage and Drainage

Subsurface seepage may be encountered seasonally along slopes which traverse on-site cemented soils and overlying surficial soils. This potential seepage may result in hydrostatic forces behind fill materials placed in these areas and potential slope instability. Therefore, we recommend a subsurface drain be installed at the back side of the keyway excavation in fill slope areas to provide drainage for subsurface seepage.

Recommendations for fill slope subdrain design and construction are provided on Plate 3. Additional subsurface drains may be needed if seepage areas are found during construction above the keyway elevation. The geotechnical engineer should review site conditions prior to engineered fill placement in slope fill areas.

2.10 PIPELINE DESIGN CRITERIA

2.10.1 General

It is our understanding the proposed pipeline for this project will be designed in accordance with Sacramento County standards. Pipe types being considered for this project include ductile iron pipe for the open cut segments and high-density polyethylene (HDPE) pipe for the trenchless crossing.

We anticipate pipe bedding and initial backfill for the open cut segments will consist of compacted Caltrans Class 2 aggregate base material or Controlled Density Fill (CDF) having a 28-day compressive strength between about 50 and 200 psi. Recommendations for design and construction of pipelines installed by open cut excavation and trenchless methods are presented in the following sections of this report.

2.10.2 Soil Loads on Buried Flexible Pipes

The pipe loading pressure for flexible pipes such as ductile iron and HDPE may be determined by calculating the soil overburden and live load pressures within the trench section. We have provided soil parameters for design of the pipeline that are based on using the Iowa formula and the prism load, which is the soil load over a full trench width section. A compacted, moist soil unit weight of 150 pounds per cubic foot is applicable to the on-site gravelly materials on the south side of the American River channel that are processed to meet engineered fill specifications. A compacted moist soil unit weight of 130 pounds per cubic foot is applicable to the sandy lean clays, clayey and silty sands located to the north side of the active river channel.

2.10.3 Live Loads on Buried Pipelines

Live loads on buried conduits due to vehicular and railroad loadings may be determined from Plate 4, Live Loads on Buried Conduit.

2.10.4 Design Values for Buried Flexible Pipes

Flexible pipes typically derive part of their resistance to ring deflection from the stiffness of initial backfill and trench wall soils. Evaluation of ring deflection of buried pipes under soil and live loads may be determined using the Iowa Formula. The elastic modulus of the soils surrounding the pipe, or E', may be evaluated by knowing the trench width, the pipe diameter, the elastic modulus of the initial backfill (E'_b), and the elastic modulus of the native trench wall soils (E'_n - also termed Constrained Modulus).

Table 2.3 presents recommended E'_b values for use in the Iowa Formula for proposed initial backfill materials placed and compacted in accordance with our recommendations. The value of E'_b is a lateral modulus of subgrade reaction for the initial backfill material. For E'_b values at depths between the intervals presented below, the E'_b value between data points may be determined by linear interpolation.

The recommended E'_b values presented in Table 2.3 apply to clean crushed rock or washed sand bedding and initial backfill material along the sides of the pipe at the recommended level of compaction. These values are applicable for pipe design where the initial backfill width is at least 2 times the pipe diameter (D) on each side of the pipe (trench width of 5D).

Table 2.3
E'b Values for Design of Buried Flexible Pipes

Soil Type	Depth to Springline of Pipe (feet)	Recommended E'_b (psi)
Pipe Bedding and Initial Backfill (clean crushed rock or washed sand)	5 10 15 20+	1000 1500 1600 1700

Notes:
1. The above design values are based on "Evaluation of the Modulus of Soil Reaction, E', and its Variation With Depth," by Hartley & Duncan, dated June 1982.
2. Based on providing at least 2 pipe diameters of backfill on each side of pipes.

Where the zone of backfill beside the pipe is less than 2D, the E'_b values presented above may not be applicable and the constrained soil modulus E'_n will affect flexible pipe design. The actual lateral soil modulus at the pipe depth will lie somewhere between E'_b and E'_n depending on the trench width.

Based on the field and laboratory data obtained along the pipeline alignment, we recommend an E'_n value of 3,000 psi (Howard, 1996) be used for design of flexible pipes.

For trench widths less than 5D, the design E' may be calculated by multiplying E'_b by the Soil Support Combining Factors (S_c) presented in Table 2.4 below, where B_d is the trench width at pipe springline and D is the diameter of the pipe.

$$\text{Design } E' = S_c(E'_b)$$

Table 2.4
Sc Values For Design of Buried Flexible Pipes
(Soil Support Combining Factor)

E'_n/E'_b	B_d /D 1.5	B_d /D 2.0	B_d /D 2.5	B_d /D 3.0	B_d /D 4.0	B_d /D 5.0
0.1	0.15	0.30	0.60	0.80	0.90	1.00
0.2	0.30	0.45	0.70	0.85	0.92	1.00
0.4	0.50	0.60	0.80	0.90	0.95	1.00
0.6	0.70	0.80	0.90	0.95	1.00	1.00
0.8	0.85	0.90	0.95	0.98	1.00	1.00
1.0	1.00	1.00	1.00	1.00	1.00	1.00
1.5	1.30	1.15	1.10	1.05	1.00	1.00
2.0	1.50	1.30	1.15	1.10	1.05	1.00
3.0	1.75	1.45	1.30	1.20	1.08	1.00
5.0	2.00	1.60	1.40	1.25	1.10	1.00

Source: "Pipeline Installation," A. Howard, 1996.

Should a narrow trench width of 1.25D be used, we recommend using a combining factor of 1.6 E'_b to calculate the design E'. If CLSM is utilized around the pipe for this trench configuration, E'_n should be used for the E'_b value.

2.10.5 Flexible Pipe Trench Width Recommendations

For flexible pipes, the trench width will affect the soil loading on the pipes. Wider trenches will generally result in higher soil loads on buried flexible pipes than narrower trenches. Where granular pipe zone backfill is used, the trench should be wide enough to accommodate compaction equipment and shoring along the sides of the pipe. Where lean concrete or CDF is used, the minimum trench width should be sufficient to allow proper placement of the material and provide the required lateral pipe support.

2.10.6 Flexible Pipe Construction Considerations

Flexible pipes generally require uniform support from bedding and initial backfill materials, especially in haunch areas, to prevent excessive ring deflection or other deformations. Care should be taken during installation of the bedding and initial backfill beneath the haunches of the pipe (i.e., from the bottom of the pipe to springline) such that voids or loose zones are eliminated and the backfill material is firm and unyielding. The initial backfill placed above the springline of the pipe should be placed evenly on both sides of the pipe in a manner to avoid deforming the top of the pipe.

The pipeline designers should evaluate the proximity of adjacent pipelines, excavations, and their related effects on the proposed construction. If proper trench wall support cannot be provided in a portion of the pipe trench, we recommend consideration be given to the use of lean concrete, CLSM or CDF bedding and initial backfill around the pipes. In general, we recommend lean concrete, CLSM, or CDF materials have a 28-day compressive strength between 50 and 200 psi.

2.11 PIPELINE THRUST BLOCKS

Thrust blocks for the buried pipelines may be designed using an allowable lateral bearing pressure of 1,200 psf at a minimum depth of 3 feet into firm native soil or engineered fill. This value may be increased by 400 psf for each additional foot of depth beyond the recommended minimum, up to a maximum value of 4,000 psf. For evaluation during temporary test cases, these values may be increased by a factor of 1.5.

2.12 TRENCHLESS RIVER CROSSING

2.12.1 General

The active American River channel will be crossed using horizontal directional drilling (HDD). It is proposed to install 24-inch nominal diameter HDPE pipe. The design of the HDD bore path has not been finalized at this time. It is anticipated that the data this report will be used to design the bore path. A preliminary bore path concept provided to us by Kennedy Jenks Consultants indicates the bore path will be about 1,000 feet long and extend to depths of up to 90 feet below the ground surface. Near the north bank of the active river channel, the minimum depth of cover along the HDD bore path is reduced to about 35 feet below the river bottom. At the south bank, it's about 70 to 80 feet deep.

Based on our geotechnical evaluation of the data discussed in this report, it is Kleinfelder's professional opinion that the proposed HDD crossing is feasible provided the geotechnical recommendations presented in this report are incorporated into design and construction. However, there are a number of conditions that could affect design and/or cause difficult drilling conditions or delays.

- Difficult jetting in hard clay and silt, cemented soils, and gravels
- Borehole instability in poorly graded sand and gravel
- Presence of cobbles and boulders affecting progress and/or selection of drilling methods
- Hydraulic fracturing in the river channel and near the exit point
- High pullback loads or stuck pipe due to caving sands and gravels
- Changed conditions claims or failure to complete the bore due to limited geotechnical information

Conclusions and recommendations regarding HDD design and construction are further discussed below. It is recommended that the proposed HDD crossing be designed and constructed in accordance with the third edition of the "Horizontal Directional Drilling Good Practices Guidelines" by the HDD Consortium (2008).

2.12.2 Anticipated HDD Drilling Conditions

The density and consistency of soils encountered in our exploratory borings were somewhat variable. The soil units on the site consist of the following:

- River channel, bank and terrace deposits (map symbols Qhc, Qha, Qm_2) composed of sands and gravels with cobbles and boulders in the river channel and areas to the south. Their depth varies from about 4 to 6 feet in the river channel (previous Borings BW-9 and BW-10, Kleinfelder 1998), and about 32 to 33 feet on the south bank at Borings B-5 and B-6.

- Dredge tailings (map symbol t) derived from the river channel and bank deposits that are composed of sands and gravels with cobbles and boulders with isolated silt and clay "slickens" deposits.

- Interlayered alluvial deposits (map symbol Qtl) that include medium dense to very dense silty, clayey and poorly-graded sands, and firm to hard silts and clays on the north side of the river and beneath the sands and gravels on the south side of the river.

The majority of cobbles and boulders observed in the active river channel and areas to the south (including natural deposits and dredge tailings) appear to be between 3 and 24 inches in maximum dimension. In many cases the gravel, cobble and boulder units contain very little fine-grained soils. Gradation test results on bulk samples of these gravel units are presented in Appendix B of the GDR. Where penetrated, these coarse-grained soils will likely need to be stabilized using special drilling mud and/or use of conductor casing driven through the gravels and into the underlying Turlock Lake Formation materials.

Groundwater levels at the site appear to be nearly coincident with river levels, except for Borings B-5 and B-6 near the existing Ranney wells. At the Ranney wells, the cones of depression from well pumping appear to have affected the groundwater levels in that area. Previous Boring B-6 drilled at the site (Kleinfelder in 1998) indicates the depth to groundwater was about 15 feet below the ground surface, or roughly coincident with the

river stage. In the present Borings B-5 and B-6, evaluation of the depth to groundwater could not be reliably measured based on the mud rotary drilling method used.

As stated above, groundwater and soil moisture conditions within the area will vary depending on rainfall, irrigation practices, and/or runoff conditions not apparent at the time of our field investigation.

The contractor should carefully evaluate the ground conditions identified in this report before selecting drilling equipment and tooling.

2.12.3 Drill Bit and Reamer Selection

Drill bits and reamers should be selected based on anticipated subsurface conditions and past experience. The drilling contractor should be prepared with a variety of bits and reamers that have worked well in similar soil conditions. The use of mud motors should be considered in gravel and cobble materials and hard or cemented soils with California sampler blow counts exceeding about 75 blows per foot and SPT blow counts exceeding about 50 blows per foot. California sampler and SPT blow counts in our exploratory borings varied with depth and the relative amounts of gravels and cobbles present in each sample. Blow counts are shown on the individual boring logs in Appendix A.

It is typical to ream the HDD bore hole to about 1.5 times the pipe outside diameter following pilot hole drilling. However, in gravels with cobbles and boulders, if special drilling mud rather than casing is used to stabilize the gravels, it may be prudent to ream the borehole to a slightly larger size to accommodate some coarse particles that may collect at the bottom of the hole.

2.12.4 Drilling Fluid Program

2.12.4.1 General

The drilling contractor should develop a Drilling Fluid Program (DFP) as part of the HDD bore plan. A properly designed DFP can substantially reduce losses due to hydraulic fracturing, stuck product pipe, or loss of tooling. The DFP should take into account

anticipated soil conditions as well as fluid selection, drill bit and reamer selection, and volume calculations.

2.12.4.2 Soil Conditions for Fluid Design

For the purpose of drilling fluid design, earth materials are divided into two categories: (1) Inert, including sands, and gravel, and (2) reactive, including clays. In the borings drilled at the site, the clay soils encountered were lean to fat and/or sandy. These soils may be reactive and prone to swelling in the bore hole. Sands and gravels encountered were poorly-graded, clayey and/or silty. Information regarding subsurface conditions likely to be encountered at the site is provided in Section 4.2, Subsurface Conditions of the GDR, as well as on the boring logs and laboratory test results contained in Appendices A, B and C of the GDR.

2.12.4.3 Drilling Fluid Selection

The DFP base fluid should be designed for site-specific soil conditions. The base fluid may consist of either a bentonite or polymer base and water, with additives to achieve specific fluid properties. In reactive clay soils the use of PHPA polymers to inhibit swelling and wetting agents to reduce stickiness may prove beneficial.

The drilling contractor should submit to the owner a base fluid design with a list of additives, loss of circulation materials, and grouting materials that may be used on the project and Material Safety Data Sheets for approval at least two weeks prior to mobilization. Assistance with drilling fluid and additive selection can be obtained from reputable drilling fluid suppliers.

2.12.5 Solids Separation Plant

Fine-grained silts and clays are generally the most difficult to remove from drilling fluids. Depending on their extent, the presence of these soils along the proposed bore path may require use of desilters/centrifuge equipment in order to remove the fine soils from the drilling fluids. Sieve and hydrometer analyses results for selected samples of these soils are included in Appendix B of the GDR.

2.12.6 Borehole Instability

The majority of the soils encountered in the borings within the proposed HDD bore depths appear to be interbedded alluvium of the Turlock Lake Formation. The soil, units consist of lean clays with sand, sandy lean clays, sandy silts, silts with sand, and silty sand. These materials were generally firm to very hard and medium dense to very dense in the borings. Zones of weak to moderate cementation were observed in the silts and sands at various depths. Based on our prior experience, these materials generally pose a low risk of HDD borehole instability. However, the river channel and bank deposits located above these materials along the south side of the river pose a high risk of HDD borehole instability. Since the drill entry point is proposed to be located in this area, stabilization of the HDD borehole within the gravel, cobble, and boulder deposits is likely to be necessary. The contractor should carefully evaluate the ground conditions identified in this report and should use means and methods appropriate for these ground conditions.

2.12.7 Loss of Circulation

Gravels with cobbles and small boulders were encountered in the upper 30 to 32 feet in Borings B-6 and B-5, respectively. Zones of poorly-graded sand with silt and gravel, and silty sand with gravel were also encountered in this zone. Loss of circulation within the proposed HDD borehole may occur in these layers and use of special drilling fluids or conductor casings will likely be needed. Product data sheets and Material Safety Data Sheets for proposed loss of circulation materials should be submitted to the owner for approval by jurisdictional regulators at least two weeks prior to mobilization.

2.12.8 Soil and Fluid Volume

The volume of soil to be removed from the HDD bores can be estimated as follows:

$$\frac{(\text{Hole Diameter in Inches})^2}{25} = \text{Volume in Gallons per Foot}$$

Sufficient fluid should be pumped during drilling and reaming operations to maintain flow. Drilling rates and drilling fluid flow rates may be adjusted in the field to match varying site conditions. However, an estimate of drilling fluid demand is useful when

sizing drilling equipment, mud pumps, and solids removal systems and can be particularly helpful in determining realistic drilling rates. Drilling fluid demand can be estimated based on the borehole volume and the ratios presented in Table 2.5 below.

Table 2.5
Drilling Fluid Demand

Soil or Rock Type	Ratio of Fluid Volume to Soil Volume
Sand, Gravel	1:1
Sand and Gravel mixed with Clay	2:1
Clay or Reactive Shale	3-5:1

Drilling rates can be estimated based on the drilling fluid demand and the pump output at the design base fluid viscosity.

2.12.9 Hydraulic Fracturing

Hydraulic fracturing occurs when borehole pressure causes plastic deformation of the soil surrounding the borehole initiating and propagating fractures in the soil mass. The resistance to plastic deformation and fracturing is a function of soil strength, overburden pressure, and pore water pressure. Hydraulic fracturing can result in drilling fluid inadvertently returning to the ground surface or running horizontally away from the borehole. Allowable borehole pressure should be evaluated during design of the HDD crossing in order to select an appropriate minimum depth beneath the river channel.

It should be noted that the minimum depth of cover occurs near the north bank of the active river channel and that the upper soils along the river bottom consist of poorly-graded gravels with sand, cobbles and boulders. These materials may allow transmission of drilling fluids through the interstitial pore spaces. Therefore, in hydraulic fracturing analyses, the gravels should not be relied on to contain drilling fluids within the bore hole. The Turlock Lake formation materials should provide resistance to drilling fluid flows.

As evidenced in the previous borings drilled in the river channel (Kleinfelder, 1998), the depths of these gravel river channel deposits varied from about 4 to 6 feet. Since that time, extreme river flows associated with the 1997/1998 winter season may have affected the scour regime and depths of channel deposits.

Borehole instability issues and/or the contactor not maintaining a clean borehole can result in poor drilling returns and partial or complete plugging of the borehole. This will result in higher fluid pressures within the bore and can lead to hydraulic fracturing and inadvertent fluid returns to the ground surface.

2.12.10 Steering

As stated above, the density and consistency of soils encountered in our exploratory borings varied. The main consideration for HDD steering is the transition between the upper loose to dense sands and gravels with cobbles and boulders along the south side of the river and the underlying interlayered alluvial deposits that include firm to very hard lean clay and silt, and medium dense to very dense silty, clayey, and poorly-graded sands.

These variations in density/consistency may cause some difficulty steering, particularly at the above-mentioned transition. Such transitions do not exist on the north side (HDD exit side) of the river.

2.12.11 Drill Pad Support

Surface conditions in the vicinity of our exploratory borings and the proposed HDD drill pad area generally consist of sands, gravels and cobbles. The contractor should conduct a pre-bid site visit to determine the suitability of site conditions for their equipment. A gravel surface course may be needed in areas containing fine-grained surficial soils especially during wet weather and near the mud pit. A gravel course is also likely to be required as a storm water pollution prevention measure to reduce track-out on adjacent roadways by construction equipment.

2.12.12 Utilities Clearance

The location of existing utilities was beyond the scope of this report. Nearby underground utilities may exist and must be located and protected by the contractor so as not to be impacted by underground construction. The bore profile should be designed to allow sufficient clearance from all underground utilities.

2.12.13 Existing Nearby Wells

In addition to the nearby CWD Ranney wells, domestic or irrigation wells may be present in the project vicinity. The presence of such wells was not investigated during this study. Consideration should be given to evaluating the risks associated with hydraulic fracturing into nearby wells. In general, wells within a horizontal distance of about 100 feet from the HDD bore path could be affected by drilling fluids depending on the depth of the bore path and fluid pressures that develop during drilling and pipe pullback.

2.12.14 Contractor Selection

The success of the project will be substantially determined by the experience and performance of the specialty contractor retained to perform the work. We recommend the use of a specialty contractor with a minimum of three years construction experience in the field of HDD techniques in similar drilling conditions on projects of similar scope (i.e., diameter, length, and depth). The contractor should be familiar with the use and design of drilling fluids, various admixtures, conductor and washover casing, and should provide examples of projects they have successfully completed installing similar utilities in similar conditions.

3 LIMITATIONS

Recommendations presented in this report are based on our field observations and subsurface conditions encountered at the time of exploration, limited laboratory tests, and on our present knowledge of the proposed construction. It is possible that soil conditions could vary between or beyond the points explored. If soil conditions encountered during construction differ from those described herein, we should be notified immediately in order that a review may be made and any supplemental recommendations provided. If the scope of the proposed construction, including the proposed loads or structural locations, changes from that described in this report, our recommendations should also be reviewed.

We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our study. No warranty is expressed or implied. The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted by Kleinfelder during the construction phase in order to evaluate compliance with our recommendations.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on site and off site) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

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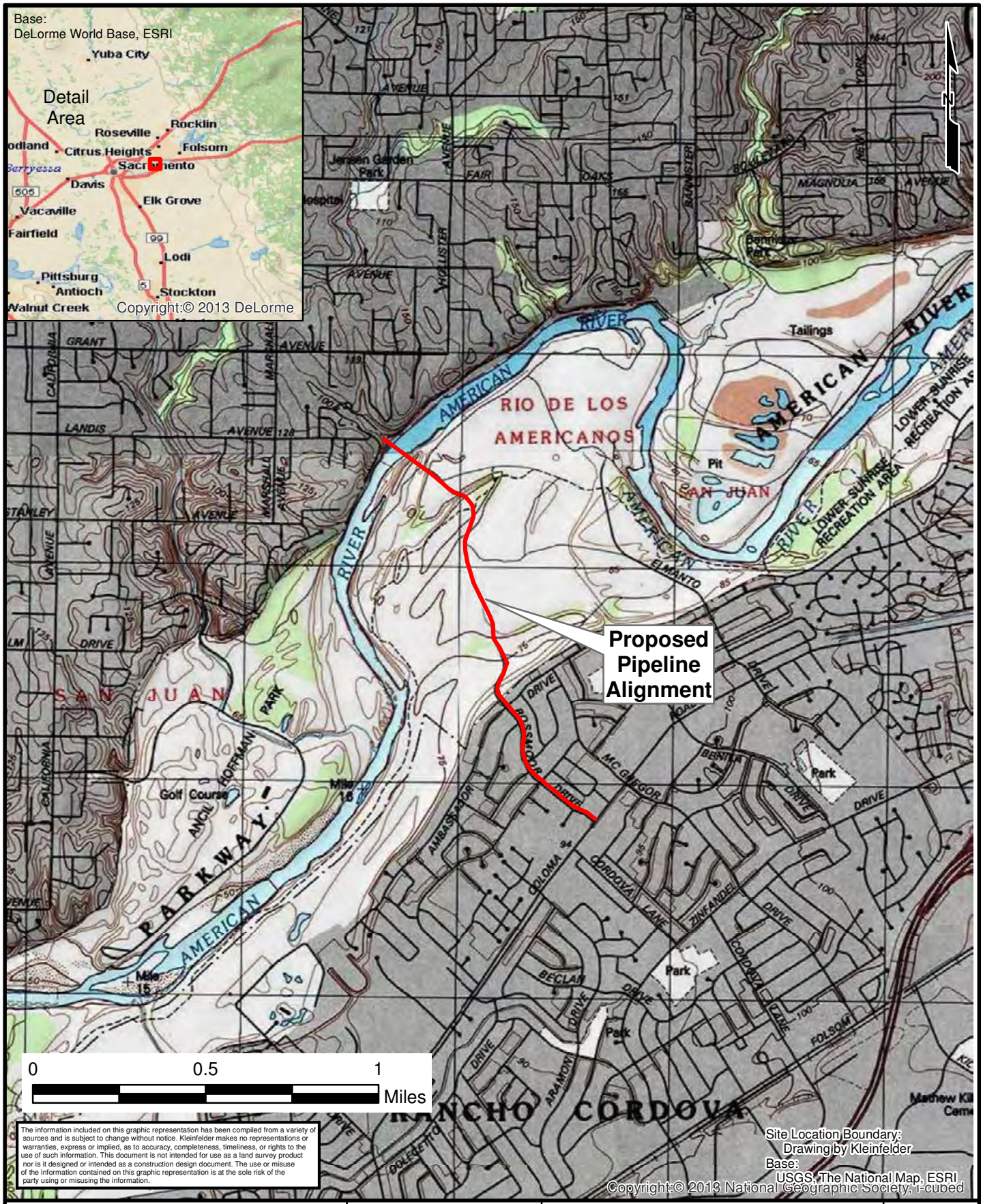

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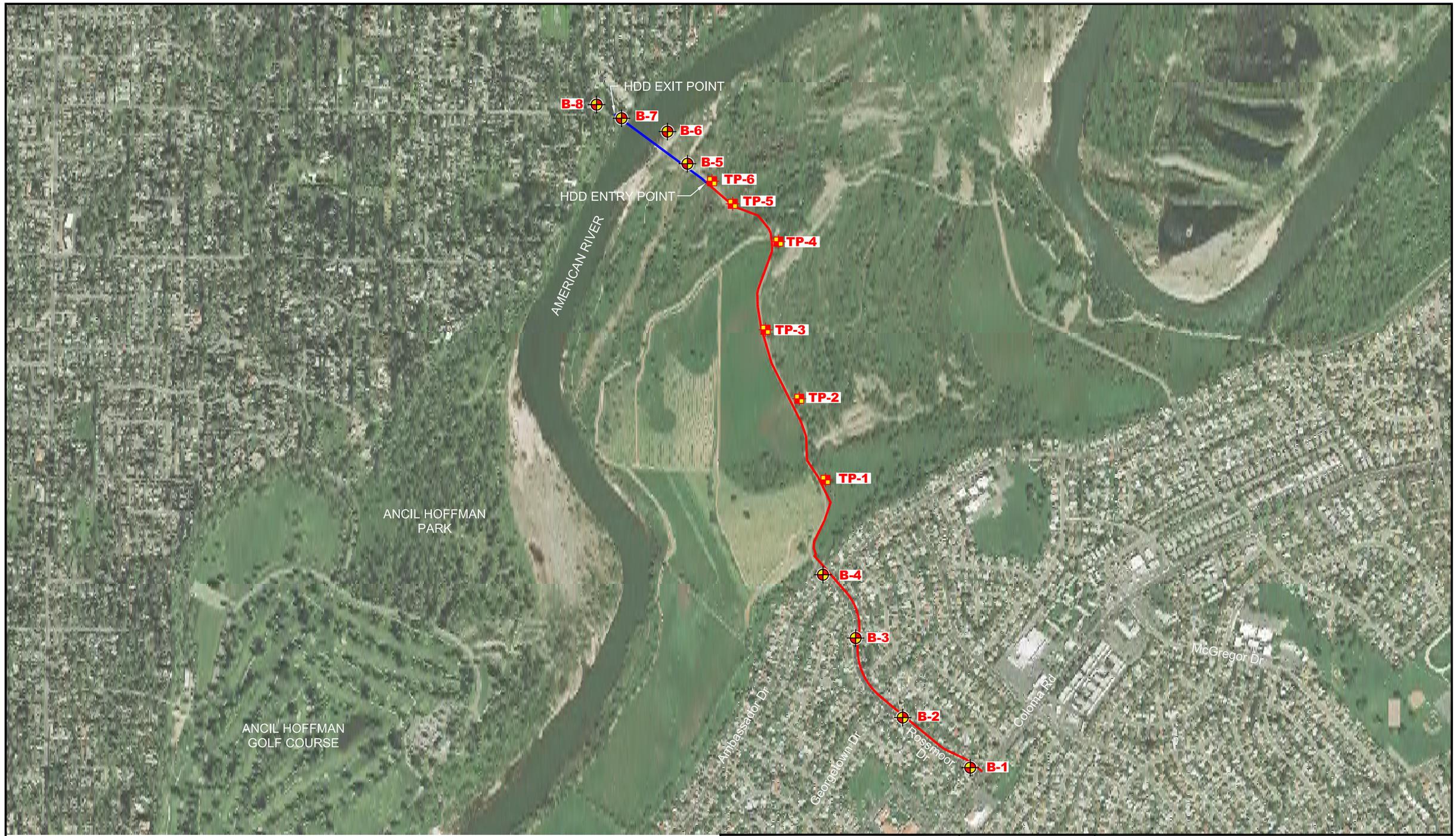
PROJECT NO.	20143401
DRAWN:	04/11/2014
DRAWN BY:	D. Ross
CHECKED BY:	K. Sorensen
FILE NAME:	CWD SLM.MXD

SITE LOCATION MAP

CWD Pipeline Conveyance Project
Carmichael/Rancho Cordova, California

PLATE
1



800 0 400 800 1,600

APPROXIMATE SCALE: 1 inch = 800 feet

LEGEND

- Approximate Boring Location
- Approximate Test Pit Location
- Proposed Pipeline Alignment

N

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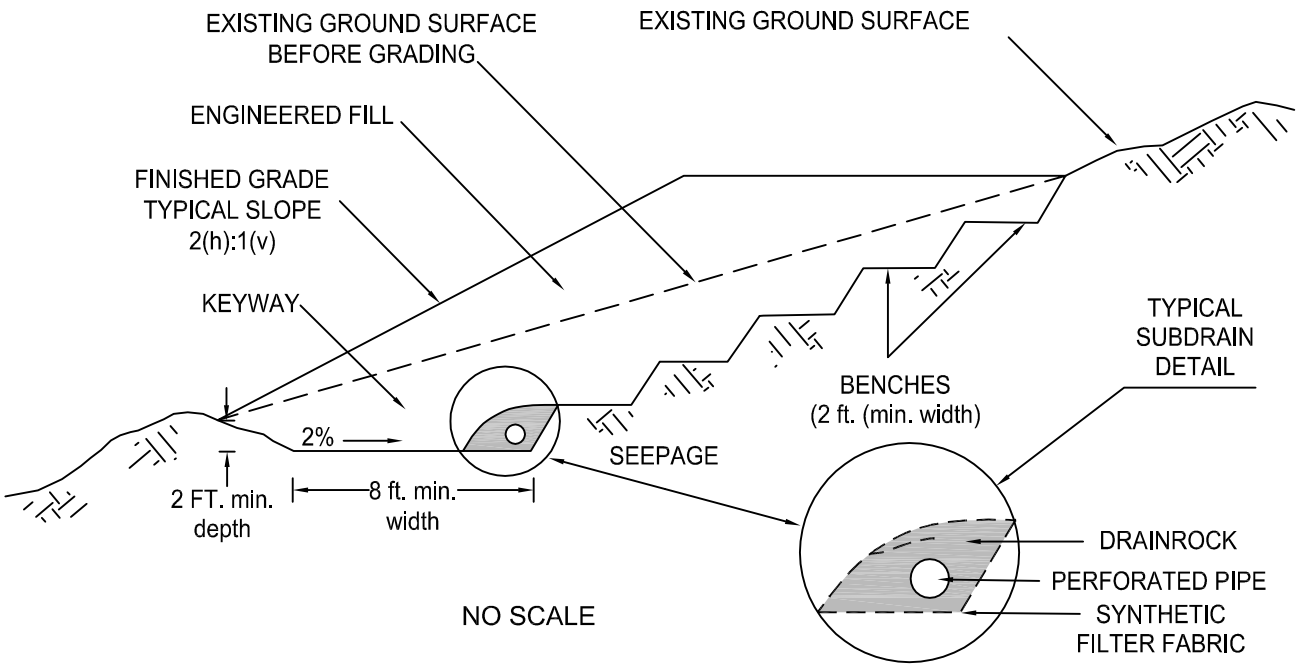
PROJECT NO.	20143401
DRAWN:	04/25/2014
DRAWN BY:	D. Ross
CHECKED BY:	K. Lenehan
FILE NAME:	20143401_2.dwg

EXPLORATION LOCATION MAP

CWD Pipeline Conveyance Project
Carmichael/Rancho Cordiva, California

PLATE
2



NOTES:

1. Benches should be sloped about two percent (2%) away from the natural slope to facilitate drainage of the fill embankment. Benches and keyway should be excavated to compenent subgrade as evaluated by the project Geotechnical Engineer during construction.

2. Cut slopes between benches should be no flatter than 1(h):1(v) and should not exceed 5 feet in height.

3. If seepage is present during construction or is suspected by the Geotechnical Engineer based on subsurface conditions encountered subsequent to site stripping or during initial grading, a subdrain should be constructed of perforated PVC pipe surrounded by drainrock, encased in a synthetic filter fabric. Specific requirements are provided below (also see detail above).

    a) Drainrock shoud consist of durable stone having 100 percent passing the 1-inch sieve and zero percent passing the No. 4 sieve.

    b) Synthetic filter fabric should be non-woven and have an equivalent opening size (EOS), a minimum flow rate of 110 gallons per minute per square foot of fabric, and a minimum puncture strength of 50 pounds.

    c) Synthetic filter fabric should be placed in accordance with manufacture's recommendations.

    d) Perforated pipe should consist of schedule 40 PVC, 4 inches in diameter, with 1/4-inch-diameter (maximum) perforations, 12 to 24 inches on-center, placed down. Pipe invert should be no more than 2 inches above the bottom of bench and/or keyway.

    e) Pipe drainage should be collected in a solid conduit and directed to a storm drain, ditch, or other suitable location for disposal.

    f) Perforated pipe should be sloped a minimum of two percent (2%) to drain.

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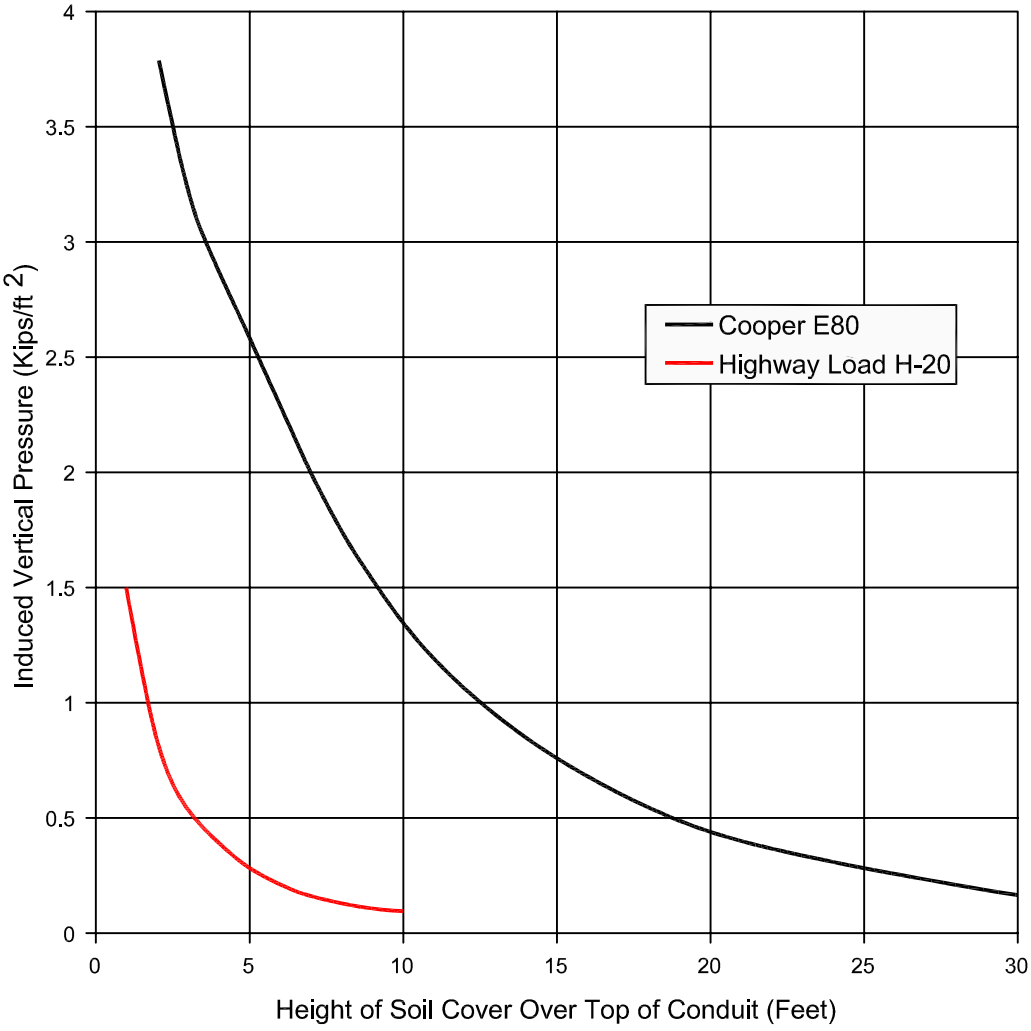
PROJECT NO.	20143401
DRAWN:	06/19/2014
DRAWN BY:	D. Ross
CHECKED BY:	K. Sorensen
FILE NAME:	GIR PLATE 3.dwg

TYPICAL KEY AND BENCH DETAIL

CWD Pipeline Conveyance Project
Carmichael/Rancho Cordova, California

PLATE
3



Reference: FHWA Website

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PROJECT NO.	20143401
DRAWN:	06/19/2014
DRAWN BY:	D. Ross
CHECKED BY:	K. Sorensen
FILE NAME:	GIR PLATE 4.dwg

LIVE LOADS ON BURIED CONDUIT

CWD Pipeline Conveyance Project
Carmichael/Rancho Cordova, California

PLATE
4

APPENDIX D

NOTICES

CARMICHAEL WATER DISTRICT

7837 Fair Oaks Boulevard
Carmichael, CA 95608
(916) 483-2452

February 6, 2015

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION ON THE ENVIRONMENTAL IMPACT OF THE AMERICAN RIVER PIPELINE CONVEYANCE PROJECT

Notice is hereby given that the Carmichael Water District (CWD), as Lead Agency, will consider the approval and adoption of a Mitigated Negative Declaration on the environmental impacts of the project entitled the American River Pipeline Conveyance Project (Proposed Project).

PROJECT LOCATION: The project site is situated on both sides of the American River in Carmichael and Rancho Cordova, approximately 12 miles east of Sacramento in Sacramento County. This location can be found within unsectioned areas of Township 9 north, Range 6 east of the Citrus Heights and Carmichael USGS 7.5 minute topographic quadrangles. The project site consists of less than 1 acre on the north bank and approximately 3 acres on the south side of the American River, and approximately 1.25 miles of pipeline along Rossmoor Drive connecting the CWD's Bajamont water treatment plant (WTP) on the north bank with Golden State Water Company (GSWC) infrastructure on Coloma Road. The elevation in the project area is approximately 120 feet above mean sea level.

PROJECT DESCRIPTION: The Proposed Project consists of: 1) pipeline construction from the Bajamont WTP under the American River to the existing water distribution system in Rancho Cordova; 2) abandoned pipeline removal across the American River to improve safety; 3) culvert replacement and bank stabilization at the unnamed drainage on the north bank; and 4) stream restoration along the north bank of the American River. Approximately 1,060 feet of the pipeline will be installed underneath the American River using horizontal directional drilling (HDD) techniques to a depth of up to 85 feet. The remaining pipeline alignment, which will follow Rossmoor Drive for 6,143 feet to the connection with existing GSWC infrastructure in Coloma Drive, will be installed using open cut trenching.

Implementation of the Proposed Project will provide treated water to GSWC to replace groundwater affected by contamination. Construction of the Proposed Project will occur in phases, with the pipeline installation phase beginning in spring/summer 2015. The second phase is the culvert replacement and bank stabilization on the north bank, which is planned for the fall to minimize impacts to listed species, with all in-water work to be completed by October 15 to avoid impacts due to sedimentation. The final phase, the removal of the abandoned pipeline and associated debris across the American River and the removal of abandoned structures on the north bank, will occur during low water flows in 2016.

PUBLIC REVIEW AND TIME FOR COMMENT: The proposed Mitigated Negative Declaration and Initial Study are available for public review and comment from the date of this Notice until March 9, 2015. Copies of the proposed Mitigated Negative Declaration and the

Initial Study may be viewed at the Carmichael Water District office at 7837 Fair Oaks Blvd, Carmichael, CA 95608; at the Carmichael branch of the Sacramento Public Library at 5605 Marconi Ave, Carmichael, CA, 95608; and online at www.carmichaelwd.org. Written comments on the document should be sent to the attention of Annalee Sanborn, 1801 7th Street, Suite 100, Sacramento, CA 95811, and must be received by 5:00 PM on Monday, March 9, 2015.

The Sacramento Bee

P.O. Box 15779 • 2100 Q Street • Sacramento, CA 95852

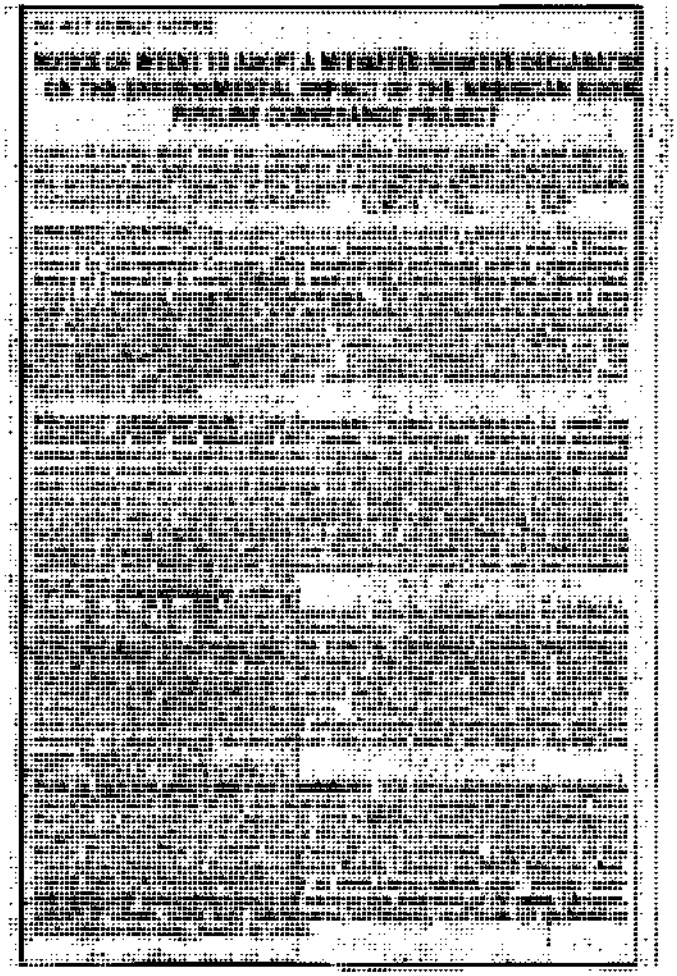
ANALYTICAL ENVIRONMENTAL SERVICES
1801 7th STREET, SUITE 100
SACRAMENTO, CA 95811

DECLARATION OF PUBLICATION
(C.C.P. 2015.5)

COUNTY OF SACRAMENTO
STATE OF CALIFORNIA

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interest ed in the above entitled matter. I am the printer and principal clerk of the publisher of The Sacramento Bee, printed and published in the City of Sacramento, County of Sacramento, State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sacramento, State of California, under the date of September 26, 1994, Action No. 379071; that the notice of which the annexed is a printed copy, has been published in each issue thereof and not in any supplement thereof on the following dates, to wit:

FEBRUARY 6, 2015



I certify (or declare) under penalty of perjury that the foregoing is true and correct and that this declaration was executed at Sacramento, California, on **FEBRUARY 6, 2015**

(Signature)

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

2015022027

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: American River Pipeline Conveyance Project

Lead Agency: Carmichael Water District | Contact Person: Steve Nugent
Mailing Address: 7837 Fair Oaks Blvd | Phone: (916)483-2452
City: Carmichael, CA | Zip: 95608 | County: Sacramento

Project Location: County: Sacramento | City/Nearest Community: Carmichael and Rancho Cordova
Cross Streets: Rossmoor Drive and Coloma Road | Zip Code: 95670
Longitude/Latitude (degrees, minutes and seconds): 38 ° 37 ' 31 N " N / 121 ° 18 ' 13 E " W | Total Acres: 4
Assessor's Parcel No.: USGS: Citrus Heights, Carmichael | Section: | Twp.: 9N | Range: 6E | Base: MDBM
Within 2 Miles: State Hwy #: 50 | Waterways: American River
Airports: None | Railways: None | Schools: Williamson Elementary

RECEIVED
FEB 06 2015
STATE CLEARING HOUSE

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☒ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other:
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other:

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: pipeline

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational: ____
☐ Recreational: ____
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☐ Other: ____

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☒ Flood Plain/Flooding
☒ Forest Land/Fire Hazard
☒ Geologic/Seismic
☒ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities
☒ Recreation/Parks
☐ Schools/Universities
☒ Septic Systems
☒ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☐ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☐ Growth Inducement
☒ Land Use
☒ Cumulative Effects
☐ Other: ____

Present Land Use/Zoning/General Plan Designation:

Sacramento County - Residential (R2); City of Rancho - Parks and Open Space (POS), Residential (R5)

Project Description: *(please use a separate page if necessary)*

The Proposed Project consists of: 1) pipeline construction from the Bajamont WTP under the American River to the existing water distribution system in Rancho Cordova; 2) abandoned pipeline removal across the American River to improve safety; 3) culvert replacement and bank stabilization at the unnamed drainage on the north bank; and 4) stream restoration along the north bank of the American River. Approximately 1,060 feet of the pipeline will be installed underneath the American River using horizontal directional drilling techniques to a depth of up to 85 feet. The remaining pipeline alignment, which will follow Rossmoor Drive for 6,143 feet to the connection with existing GSWC infrastructure in Coloma Drive, will be installed using open cut trenching. The Project will provide treated water to GSWC to replace groundwater affected by contamination.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

____	Air Resources Board	____	Office of Historic Preservation
____	Boating & Waterways, Department of	____	Office of Public School Construction
____	California Emergency Management Agency	X	Parks & Recreation, Department of
____	California Highway Patrol	____	Pesticide Regulation, Department of
X	Caltrans District #3	____	Public Utilities Commission
____	Caltrans Division of Aeronautics	X	Regional WQCB #5
____	Caltrans Planning	____	Resources Agency
X	Central Valley Flood Protection Board	____	Resources Recycling and Recovery, Department of
____	Coachella Valley Mtns. Conservancy	____	S.F. Bay Conservation & Development Comm.
____	Coastal Commission	____	San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
____	Colorado River Board	____	San Joaquin River Conservancy
X	Conservation, Department of	____	Santa Monica Mtns. Conservancy
____	Corrections, Department of	X	State Lands Commission
____	Delta Protection Commission	____	SWRCB: Clean Water Grants
____	Education, Department of	X	SWRCB: Water Quality
____	Energy Commission	X	SWRCB: Water Rights
X	Fish & Game Region #2	____	Tahoe Regional Planning Agency
____	Food & Agriculture, Department of	____	Toxic Substances Control, Department of
____	Forestry and Fire Protection, Department of	X	Water Resources, Department of
____	General Services, Department of		
____	Health Services, Department of	X	Other: U.S. Army Corps of Engineers
____	Housing & Community Development	____	Other:
____	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date February 6, 2015 Ending Date March 9, 2015

Lead Agency (Complete if applicable):

Consulting Firm: Analytical Environmental Services
Address: 1801 7th Street, Suite 100
City/State/Zip: Sacramento, CA, 95811
Contact: Annalee Sanborn
Phone: (916) 447-3479

Applicant: Carmichael Water District
Address: 7837 Fair Oaks Blvd
City/State/Zip: Carmichael, CA, 95608
Phone: (916) 483-2452

Signature of Lead Agency Representative: _____ **Date:** 2/6/15

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

APPENDIX E

COMMENTS RECEIVED ON IS/MND

APPENDIX E

COMMENTS RECEIVED

A Notice of Intent (NOI) for the Initial Study/Mitigated Negative Declaration (IS/MND), dated February 6, 2015, prepared for the proposed American River Pipeline Conveyance Project, was circulated to interested parties for comment from February 6, 2015 to March 9, 2015. The NOI describes the Carmichael Water District (CWD)'s intent to adopt a Mitigated Negative Declaration for the environmental impacts of the Proposed Project.

Copies of the NOI and IS/MND were sent to State and local agencies, as well as the State Clearinghouse. The NOI was published in the Sacramento Bee, a newspaper of local distribution, as well as posted in the Sacramento County Clerk's office (**Appendix D**). CWD received five letters in response to the Initial Study. Comment letters received are listed in **Table 1** and provided in their entirety on the following pages. Issues documented in the comment letters are individually bracketed and numbered in the margins of the comment letters. Responses to the numbered comments are provided in **Appendix F** of this Initial Study.

TABLE 1
LIST OF COMMENTERS AND LETTERS RECEIVED ON THE IS/MND

Letter	Agency	Individual or Signatory	Address	Date
1	State Water Resources Control Board	Ali R. Rezvari, P.E., Sacramento District Engineer	P.O. Box 997377 Sacramento, CA 95899	March 4, 2015
2	Central Valley Regional Water Quality Control Board	Trevor Cleak, Environmental Scientist	11020 Sun Center Drive #200 Rancho Cordova, CA 95670	March 2, 2015
3	Central Valley Flood Protection Board	Mitra Emami, Chief Permitting Section	3310 El Camino Ave., Rm 151 Sacramento, CA 95821	March 5, 2015
4	California State Lands Commission	Cy Oggins, Chief Division of Environmental Planning and Management	100 Howe Ave. Suite 100-South Sacramento, CA 95825-8202	March 6, 2015
5	Sacramento Municipal Utility District	Rob Ferrera, Environmental Specialist	P.O. Box 15830 Sacramento, CA 95852-0830	March 9, 2015

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
MATTHEW RODRIQUEZ
SECRETARY FOR ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

March 4, 2015

PWS No. 3410004

Steve Nugent, P.E.
General Manager
Carmichael Water District
7837 Fair Oaks Blvd.
Carmichael, CA 95608

CARMICHAEL WATER DISTRICT (PWS3 3410004) – AMERICAN RIVER PIPELINE CONVEYANCE PROJECT 90% SUBMITTAL

Steve Nugent, P.E.:

The California State Water Resources Control Board, Division of Drinking Water (DDW) received an email from Annalee Sanborn of Analytical Environmental Services on February 12, 2015, regarding Carmichael Water District public water system (PWS# 3410004) American River Pipeline Conveyance Project.

The aforementioned project documents have been reviewed by Salvador Turrubiartes, P. E., from this office. Salvador Turrubiartes' comments are enclosed for you review and action.

If you have any questions, or if we can be of any assistance, please do not hesitate to contact Salvador Turrubiartes by email at Salvador.turrubiartes@Waterboards.ca.gov or (916) 552-9998.

1-01

Sincerely,

Ali R. Rezvani, P.E.
Sacramento District Engineer
Drinking Water Field Operations Branch

Enclosure.

cc: Salvador Turrubiartes, P.E. – Associate Sanitary Engineer
Bridget Benning – Senior Environmental Scientist SWRCB DFA
Gabriel Edwards – Environmental Scientist SWRCB DFA
Annalee Sanborn – Analytical Environmental Services

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

TO: Ali R. Rezvani, P.E.
Sacramento District Engineer

FROM: Salvador Turrubiartes, P.E.
Associate Sanitary Engineer

Salvador Turrubiartes 3/4/15

DATE: March 4, 2015

SUBJECT: CARMICHAEL WATER DISTRICT (PWS NO. 3410004) – AMERICAN RIVER PIPELINE CONVEYANCE PROJECT INITIAL STUDY

On Wednesday, February 12, 2015, the State Water Resources Control Board, Division of Drinking Water (Division) received a copy of the American River Pipeline Conveyance Project Initial Study, prepared by Analytical Environmental Services in February 2015. The Carmichael Water District (PWS No. 3410004) is the Lead Agency in the construction and operation of the American River Pipeline Conveyance Project, the project consists of:

1. A new pipeline construction under the American River from Carmichael Water District to Golden State Water Company - Cordova (PWS No. 3410015) in Rancho Cordova; specifically to deliver treated water from the Bajamont Water Treatment Plant (BWTP) (Source No. 3410004-022) to Rossmoor Drive, to replace groundwater source of supplies within the Rancho Cordova area that has been lost to contamination.

2. Old pipe removal from the American River (exposed Ranney Collector raw water pipelines to the Carmichael WD's distribution system, creating safety hazard across the American River)

3. Culvert replacement and north bank stabilization at the unnamed drainage (Aerojet GET LB facility drainage),

4. Stream restoration along the north and south banks of the American River

1-02

The water system provides treated water to its customers in its approximately 8-square mile service area. The water system services a population of approximately 40,000 people and maintains 12,000 connections to predominantly residential and some commercial customers. Approximately 70 to 80% of the water systems drinking water is obtained from the American River via appropriative water rights held by the Carmichael Water District. The remaining 20 to 30% of the water system's drinking water is obtained from groundwater wells.

American River Pipeline Conveyance Project – Initial Study

The purpose of the Initial Study was to identify potentially significant impacts, and where applicable, presents mitigation measures that would reduce all identified environmental impacts to less-than-significant levels. The Division does not review projects for their environmental impact but for their

Comment Letter 1

potential sanitary hazards to drinking water. The following comments are based on potential impacts to drinking water operations. 1-02 (Cont.)

Comment 1: How will the intertie between Carmichael WD and GSWC-Cordova be operated, will the line be opened automatically based on pressure or will it be manually opened when necessary? Where will this valve be located? 1-03

Comment 2: A copy of the proposed Use Agreement shall be provided to the Division for review and/or comments. 1-04

Comment 3: Will there be adequate protection of the north and south river banks that the pipeline will pass through from erosion during high river flow during severe storm events? The project describes measures taken to strengthen the northern bank to handle high storm water runoff with the addition of GET LB discharge flows, but high river flows should also be accounted for the north and south banks, to reduce the risk of pipeline breakage. 1-05

Comment 4: The old pipeline that was used to deliver water from the Ranney Collectors to Carmichael WD distribution system will be removed. Is this pipeline still used by the CWD to deliver water to the BWTP? Details of replacement raw water pipeline to BWTP should also be provided to the Division for review and/or comment. 1-06

Comment 5: Will there be any impact to BWTP's continuous operation while this project is underway? Will chemical deliveries to BWTP be influenced? 1-07

APPENDIX A: 90 % Submittal Plans for American River Pipeline Conveyance Project (8/2014)

General Comment 1: Reference Symbols should be properly referenced, see table below. These should be fixed.

Table 1 - Summary of Incorrect Reference Symbols

Sheet	Detail
C3	(1/C3), (2/C3), (4/C3), (5/C3)
C13	(3/C15)
C15	(3/C11)

General Comment 2: Details/Callouts reference as GSWC STD. DWG. (1.03, 2.03, 5.03, 5.05, etc.) shall be included in the drawings.

Comment 6: (SHEET C3) Details of the Existing (E) 24" Water (W) line being relocated shall be provided. Please clarify. 1-08

Comment 7: (SHEET C5) Explain why a 48" STEEL CONDUCTOR CASING is provided for the transmission pipeline in the South Bank but not for the North Bank.

Comment 8: (SHEET C6) A better Detail View of the pipeline from the Carmichael WD BWTP to the METER STATION and to the HDD PIPELINE should be provided.

Comment 9: (SHEET C11, SHEET C12, SHEET C13) The transmission pipeline from Carmichael WD to GSWC - Cordova located along Rossmoor Drive, crosses closely to at least fourteen (14) non-potable water lines (storm drains, sewer mains) and one gas utility line, see Table 2 below.

Comment Letter 1

Table 2 - Summary of Non-potable line crossing

Crossing # (sheet)	Station No.	New Water Main	Non-Potable Drainage Component Being Undercrossed.	Non-Potable Drain Pipe Material
SHEET C11	STA 60+45.43	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C11	STA 63+14.27	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C11	STA 63+47.09	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C12	STA 70+10.58	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C12	STA 71+01.62	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C12	STA 73+20.74	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C12	STA 73+59.99	24" DIP	24" Storm Drain (SD)	Unknown
SHEET C12	STA 73+71.64	24" DIP	8" Sanitary Sewer (SS)	Unknown
SHEET C12	STA 74+14.68	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C13	STA 76+17.60	24" DIP	6" Storm Drain (SD)	Unknown
SHEET C13	STA 79+86.64	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C13	STA 80+20.50	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C13	STA 80+34.54	24" DIP	6" Sanitary Sewer (SS)	Unknown
SHEET C13	STA 80+67.47	24" DIP	12" Storm Drain (SD)	Unknown
SHEET C13	STA 83+86.90	24" DIP	Gas Line	Unknown

According to Section 64572(a) & (b) of the California Code of Regulations (CCR):

(a) New water mains and new supply lines shall not be installed in the same trench as, and shall be at least 10 feet horizontally from and one foot vertically above, any parallel pipeline conveying:
(1) Untreated sewage,
(2) Primary or secondary treated sewage,
(3) Disinfected secondary-2.2 recycled water (defined in section 60301.220),
(4) Disinfected secondary-23 recycled water (defined in section 60301.225), and
(5) Hazardous fluids such as fuels, industrial wastes, and wastewater sludge.

1-08 (Cont.)

(b) New water mains and new supply lines shall be installed at least 4 feet horizontally from, and one foot vertically above, any parallel pipeline conveying:
(1) Disinfected tertiary recycled water (defined in section 60301.230), and
(2) Storm drainage.

Section 64572(h) further states, "...with Division approval, newly installed water mains may be exempt from these separation requirements under specific conditions."

The Division would require that the following be implemented where separation requirements between water mains and non-potable pipelines cannot reasonable be met:

1. Where the water main is placed below a non-potable pipeline, at least one foot of vertical separation shall be maintained.

2. The water main shall be constructed with Class 350 ductile iron pipe and covered with 8-mm of polyethylene wrap.

3. The water main and appurtenances shall be constructed with restrained joints the entire length that do not comply with Section 64572 of the CCR.

Comment Letter 1

4. The water main shall be placed such that pipe joints will be as distant as far away as possible from the centerline of the storm drain pipeline.

In cases where the water system **cannot** meet the regulations mentioned above, a waiver should be requested with details of the pipe material, type of joints, and if pipe sections shall be covered with protective coating to help prevent external corrosion.

Comment 10: (SHEET C15) Please clarify why a 16" W (BYPASS) is provided for the GSWC METER STATION and not for the CWD METER STATION. 1-08 (Cont.)

The following comments are based only on the American River Pipeline Conveyance Project – Initial Study (February 2015) and the American River Pipeline Conveyance Project – 90% Submittal Drawings (August 2014).

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

Central Valley Regional Water Quality Control Board

2 March 2015

Steve Nugent
Carmichael Water District
7837 Fair Oaks Blvd
Carmichael, CA 95608

CERTIFIED MAIL
7014 2120 0001 3978 0421

COMMENTS TO REQUEST FOR REVIEW FOR THE MITIGATED NEGATIVE DECLARATION, AMERICAN RIVER PIPELINE CONVEYANCE PROJECT, SCH# 2015022027, SACRAMENTO COUNTY

Pursuant to the State Clearinghouse's 6 February 2015 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Mitigated Negative Declaration* for the American River Pipeline Conveyance Project, located in Sacramento County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

2-01

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Comment Letter 2

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

2-02

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

2-03

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

2-04

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916) 557-5250.

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Comment Letter 2

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. 2-05

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. 2-06

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

Regulatory Compliance for Commercially Irrigated Agriculture

If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program.
There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/app_approval/index.shtml; or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov. 2-07

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100.** Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 10-100 acres are currently $1,084 + $6.70/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory

Comment Letter 2

Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov. 2-07 (Cont.)

Low or Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Dewatering and Other Low Threat Discharges to Surface Waters* (Low Threat General Order) or the General Order for *Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order). A complete application must be submitted to the Central Valley Water Board to obtain coverage under these General NPDES permits.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf 2-08

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0073.pdf

If you have questions regarding these comments, please contact me at (916) 464-4684 or tcleak@waterboards.ca.gov.

Trevor Cleak
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY
EDMUND G. BROWN JR., GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. 151
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-0685 FAX: (916) 574-0682

Comment Letter 3

March 5, 2015

Carmichael Water District
7837 Fair Oaks Boulevard
Carmichael, California 95608

We have received your application for a Central Valley Flood Protection Board encroachment permit for the following work:

Description: To construct a new pipeline beneath the American River from Carmichael to Rancho Cordova; remove the existing pipeline from the American River; replace culverts and perform bank stabilization; perform stream restoration along the north and south banks of the American River; plant vegetation in the staging areas.

Location: The project is located east of Landis Avenue in Carmichael and extends across the American River and follows Rossmoor Drive to a point slightly north of the intersection of Rossmoor Drive and Ambassador Drive in Rancho Cordova.
Section 22, 23, T9N, R6E, MDB&M
(American River, Sacramento County)

3-01

If you find any discrepancies between the works you are proposing and what is described above, please notify the Board at 3310 El Camino Avenue, Room 151, Sacramento, California, 95821, immediately, in writing. Please be advised that the proposed project cannot begin until your application has been approved and a Board permit has been granted to you. If your application is complete or that additional information is needed, we will notify you within 30 days.

For further information, contact Brian Cullum of my staff at (916) 574-0279.

Sincerely,

Mitra Emami

Mitra Emami, Chief
Permitting Section
Central Valley Flood Protection Board

RECEIVED
MAR 09 2015
CARMICHAEL WATER DISTRICT

Comment Letter 4

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

JENNIFER LUCCHESI, *Executive Officer*
(916) 574-1800 *Fax* **(916) 574-1810**
California Relay Service TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1890**
Contact FAX: **(916) 574-1885**

Established in 1938

March 6, 2015

File Ref: SCH #2015022027

Steve Nugent
Carmichael Water District
7837 Fair Oaks Blvd.
Carmichael, CA 95608

Subject: Initial Study/Mitigated Negative Declaration (MND) for the American River Pipeline Conveyance Project, Sacramento County

Dear Mr. Nugent:

The California State Lands Commission (CSLC) staff has reviewed the subject Initial Study/Mitigated Negative Declaration (MND) for the American River Pipeline Conveyance Project (Project), which is being prepared by the Carmichael Water District (District). The District, as a public agency proposing to carry out a project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq). The CSLC is a trustee agency for projects that could directly or indirectly affect sovereign lands and their accompanying Public Trust resources or uses. Additionally, because the Project involves work on sovereign lands, the CSLC will act as a responsible agency.

CSLC Jurisdiction and Public Trust Lands

4-01

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On navigable non-tidal waterways, including lakes, the

Comment Letter 4

State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, except where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

The proposed Project is located along the American River near the communities of Carmichael and Rancho Cordova and at the Aerojet Groundwater Extraction and Treatment LB facility outlet channel (referred to as the "unnamed drainage"). After reviewing the information contained in the MND, CSLC staff has determined the Project will be located along areas of the natural bed of the American River on State-owned sovereign land under the jurisdiction of the CSLC. Therefore, a lease from the CSLC will be required for the Carmichael Water District to implement the Project on sovereign lands. Please contact Wendy Hall (see contact information below) for further information about the extent of the CSLC's sovereign ownership and leasing requirements.

These comments are made without prejudice to any future assertion of State ownership or public rights, should circumstances change, or should additional information become available. This letter is not intended, nor should it be construed as a waiver or limitation of any right, title, or interest of the State of California in any lands under its jurisdiction.

Project Description

The District proposes to improve the water conveyance system crossing the American River and stream bank stability to meet its objectives and needs as follows:

4-01 (Cont.)

- Provide treated water to replace water lost from contamination by constructing a new pipeline crossing;
- Protect public utilities and private property adjacent to the Bajamont Water Treatment Plant;
- Enhance the hydrological connection between the American River and the unnamed drainage; and
- Improve water supply for drought conditions.

From the Project Description, CSLC staff understands that the Project would include the following components:

- Removal of the old pipeline from the American River;
- Installation of 1,060 feet of new 24- to 30-inch pipeline under the American River;
- Removal of the existing culvert;
- Installation of a new, bottomless culvert; and
- Implementation of stream restoration activities along the banks of the American River, including grading the riverbank to reduce erosion, removing the abandoned steel and concrete utility pads, and planting native vegetation.

Environmental Review

CSLC staff requests that the Carmichael Water District consider the following comments on the Project MND.

Comment Letter 4

1. Biological Resources: The MND indicates on page 3-28 that the wooly rose-mallow, a rare plant species, "may be present" in the Project area along the south bank of the American River because the reconnaissance level survey conducted for the Project did not occur during the blooming season, and therefore could not adequately rule out presence. Proposed Mitigation Measure BR-1, as stated on page 3-45, is to conduct preconstruction surveys for this species during the blooming period and establishment of a 25-foot buffer zone if presence of the species is confirmed. The MND does not, however, indicate the scientific rationale for this buffer or whether consultation with relevant agencies took place. As a result, it is not clear whether the proposed 25-foot buffer zone is feasible or adequate to avoid, minimize or mitigate potential impacts to the plant. CSLC staff recommends Mitigation Measure BR-1 be expanded to include measures that would be implemented if presence was confirmed on the Project site and avoidance was infeasible due to Project needs. For example, the measure should indicate whether wooly rose-mallow plants would be translocated or planted onsite or offsite, and should specify success criteria for any such translocated or planted individuals. 4-02

2. Noise: To mitigate for noise impacts, Mitigation Measure N-3 on Page 3-89 of the MND states that staging areas will be located a minimum of 200 feet from the residential uses. However, Figure 10 on page 3-30 of the MND (see also Appendix B, Figure 7 on page 42) appears to depict a staging area within 200 feet of a residence. CSLC staff recommends the proposed staging area location within 200 feet of a residence be moved to be compatible with the 200-foot buffer zone for noise impacts, or the mitigation measure specify that noise generating actions will not be conducted in the staging area depicted on these two maps in the text of the MND and in Appendix B. 4-03

4. Mitigation and Monitoring Reporting Program: Adoption of a Mitigation Monitoring and Reporting Program (MMRP) is required as part of project approval (see State CEQA Guidelines, §§ 15074, subd. (d), 15097). MMRPs are commonly included in Draft MNDs to facilitate public review but are not required to be included; the MND circulated for public review for this Project did not include an MMRP. CSLC staff recommends an MMRP be included as part of the Final MND to ensure transparency and public disclosure. The MMRP should include methods for coordination, timing for implementation of mitigation measures and list all parties and/or agencies, in addition to the District, responsible for ensuring compliance and enforcement through permit conditions, agreements or other measures during each phase of the Project. 4-04

Cultural Resources

5. Submerged Resources: The MND should evaluate potential impacts to submerged archaeological sites and historic or cultural resources in the Project area. CSLC staff requests that the District contact Assistant Chief Counsel Pam Griggs (see contact information below) to obtain CSLC records of submerged cultural resources for the Project site. Please note that any submerged archaeological site or 4-05

Comment Letter 4

submerged historic resource that has remained in State waters for more than 50 years is presumed to be significant. 4-05 (Cont.)

6. Title to Resources: The MND should also mention that the title to all archaeological sites and historic or cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the CSLC (Pub. Resources Code, § 6313). CSLC staff requests that the District consult with Assistant Chief Counsel Pam Griggs should any cultural resources on state lands be discovered during construction of the proposed Project. 4-06

Thank you for the opportunity to comment on the MND for the Project. As a responsible and trustee agency, the CSLC will need to rely on the Final MND for the issuance of any new lease as specified above and, therefore, we request that you consider our comments prior to adopting the MND.

Please send copies of future Project-related documents, including electronic copies of the Final MND, MMRP, and Notice of Determination (NOD) when they become available, and refer questions concerning environmental review to Mara Noelle, Senior Environmental Scientist, at (916) 574-2388 or via e-mail at Mara.Noelle@slc.ca.gov. For questions concerning archaeological or historic resources under CSLC jurisdiction, please contact Assistant Chief Counsel Pam Griggs at (916) 574-1854 or via email at Pamela.Griggs@slc.ca.gov. For questions concerning CSLC leasing jurisdiction, please contact Wendy Hall, Public Land Management Specialist, at (916) 574-0994, or via email at Wendy.Hall@slc.ca.gov. 4-07

Sincerely,

Cy R. Oggins, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
P. Griggs, CSLC
E. Milstein, CSLC
M. Noelle, CSLC
W. Hall, CSLC

Comment Letter 5

SMUD

March 9, 2015

Steve Nugent
Carmichael Water District
7837 Fair Oaks Blvd
Carmichael, CA 95608

Subject: MND, American River Pipeline Conveyance Project

Dear Mr. Nugent,

The Sacramento Municipal Utility District (SMUD) appreciates the opportunity to provide comments on the MND, American River Pipeline Conveyance Project. SMUD is the primary energy provider for Sacramento County and the proposed project location. SMUD's vision is to empower our customers with solutions and options that increase energy efficiency, protect the environment, reduce global warming, and lower the cost to serve our region. As a Responsible Agency, SMUD aims to ensure that the proposed project limits the potential for significant environmental effects on SMUD facilities, employees, and customers.

It is our desire that the MND, American River Pipeline Conveyance Project will acknowledge any project impacts related to the following:

- Overhead and or underground transmission and distribution line easements
- Electrical load needs/requirements
- Energy Efficiency
- Utility line routing
- Climate Change

5-01

SMUD would like to be involved with discussing and resolving the above issues as well discussing any other potential issues. We aim to be partners in the efficient and sustainable delivery of the proposed project. Please ensure that the information included in this response is conveyed to the project planners and the appropriate project proponents.

Environmental leadership is a core value of SMUD and we look forward to collaborating with you on this project. Again, we appreciate the opportunity to provide input on the MND. If you have any questions regarding this letter, please contact Rob Ferrera, SMUD Environmental Specialist at (916) 732-6676.

Sincerely,

Rob Ferrera
Environmental Specialist
Environmental Management
Legislative & Regulatory Affairs
Sacramento Municipal Utility District

Cc: Jose Bodipo-Memba
Pat Durham
Joseph Schofield
Kim Crawford

5-01
(Cont.)

APPENDIX F

RESPONSES TO COMMENTS

APPENDIX F
RESPONSES TO COMMENTS

Comments received from State and local agencies are addressed below. All of the comments, which have been bracketed and numbered in the margin for ease of reference, are provided in **Appendix E**. Once an issue is addressed, subsequent responses to similar comments reference the initial response. This format eliminates redundancy where multiple comments have been submitted on the same issue. In addition to the written comments provided in **Appendix E**, a meeting was held on March 6, 2015 between the Carmichael Water District (CWD; District) and the neighboring property owners (Cheryl Bly-Chester and Karl Bly) to receive verbal comments. These comments were addressed via revisions to the Final Initial Study, as appropriate.

Comment Letter 1 –State Water Resources Control Board, March 4, 2015

Response to Comments 1-01 and 1-02

Comments noted. The project description provided herein is consistent with the project description provided in Section 3.0 of the Initial Study.

Response to Comment 1-03

The intertie will be operated with a continuous flow of drinking water to the Golden State Water Company (GSWC). A flow control valve with a set point flow and meter tied into CWD's SCADA system will modulate flow to the set point. High-flow and low-flow conditions will alarm the plant operators via SCADA. This valve and meter station will be located below CWD's Bajamont water treatment plant (WTP) at the connection between CWD's existing 24-inch water line and the new 24-inch line.

Response to Comment 1-04

The proposed Use Agreement between CWD and GSWC is being developed and will be provided to the Division of Drinking Water when it is available. However, this is not within the scope of this CEQA document.

Response to Comment 1-05

As discussed in Section 2.5.1 of the Initial Study, the proposed pipeline underneath the American River (known as the American River crossing segment) will be installed using horizontal directional drilling (HDD) techniques into the underlying hardpan. As shown in **Appendix A** of the Initial Study, the pipeline is fully restrained at all joints and anchored at the southern HDD entry using the conductor casing to a depth of 65 feet below grade. The northern HDD exit point emerges approximately 150 feet beyond the bank. As such, high flows of the American River have been accounted for in the design of the pipeline and are unlikely to cause an adverse impact to the pipeline.

Response to Comment 1-06

The old pipeline that connected the Ranney collectors to the CWD distribution system is abandoned and is no longer a part of the water diversion and transmission system to the Bajamont WTP. This has been clarified in Section 2.5.1 of this Final Initial Study

Response to Comment 1-07

There will be no interruption of the Bajamont WTP operations. The Bajamont WTP operates two outgoing transmission lines; therefore, any outage will be limited to one transmission main at a time. No chemical deliveries will be affected.

Response to Comment 1-08

Comments noted. Kennedy Jenks has reviewed these comments to the 90 Percent Drawings and revised the plans as appropriate. These will be submitted to the Division of Drinking Water with the 100 Percent Drawings. However, these comments are not significant environmental concerns as discussed in the CEQA *Guidelines*, and are therefore not addressed further in this Initial Study.

Comment Letter 2 –Central Valley Regional Water Quality Control Board, March 2, 2015

Response to Comment 2-01

The Proposed Project will obtain coverage under the General Permit for Stormwater Discharges Associated with Construction Activities (Construction General Permit), as discussed in Section 2.6 and Mitigation Measure GS-2. **Appendix G** of this Final Initial Study is a Mitigation, Monitoring, and Reporting Plan (MMRP) that is designed to ensure that the mitigation measures identified in the Initial Study for the Proposed Project are fully implemented. The MMRP, as presented in **Appendix G**, describes the timing and frequencies of mitigation implementation responsibilities and standards, and verification of compliance for the mitigation measures identified in the Initial Study. As the CEQA Lead Agency, the District will ensure that mitigation measures are implemented and will serve as a point of contact for the public.

Response to Comment 2-02

The Proposed Project does not involve connection to, discharges to or from, or improvements to a municipal storm sewer system. As such, the Phase I and Phase II Municipal Separate Storm Sewer System (MS4) permits are not applicable to the Proposed Project.

Response to Comment 2-03

The Proposed Project does not involve stormwater discharges from an industrial site. As such, the Industrial Stormwater General Permit is not applicable to the Proposed Project.

Response to Comment 2-04

The Proposed Project requires a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers (USACE), as stated in Section 2.6 and Section 3.5.2 of the Initial Study. This permit is also required for each applicable project component in Mitigation Measures BR-3 through BR-6. Refer to **Response to Comment 2-01** for a discussion of the enforcement of mitigation measures via the MMRP.

Response to Comment 2-05

The Proposed Project requires a Section 401 Water Quality Certification from the Central Valley Regional Water Quality Control Board (RWQCB), as stated in Section 2.6 and Section 3.5.2 of the Initial Study. This certification is also required for each applicable project component in Mitigation Measures BR-3 through BR-6. Refer to **Response to Comment 2-01** for a discussion of the enforcement of mitigation measures via the MMRP.

Response to Comment 2-06

The project site contains only jurisdictional waters of the U.S., as discussed in Section 3.5.1 of the Initial Study. There are no non-jurisdictional waters or waters of the State. Therefore, the waste discharge requirements discussed in this comment are not applicable.

Response to Comment 2-07

The Proposed Project does not involve commercially irrigated agriculture. As such, the coalition group and general waste discharge requirements listed in this comment are not applicable.

Response to Comment 2-08

The Proposed Project will not include construction dewatering that involves discharges to groundwater. As such, the Low or Limited Threat General NPDES Permit is not applicable.

Comment Letter 3 – Central Valley Flood Protection Board, March 5, 2015

Response to Comment 3-01

Comment noted. The project description provided herein is consistent with the project description provided in Section 3.0 of the Initial Study.

Comment Letter 4 – California State Lands Commission, March 6, 2015

Response to Comment 4-01

Comment noted. The project description provided herein is consistent with the project description provided in Section 3.0 of the Initial Study. The Proposed Project will obtain a permit or lease of State lands from the California State Lands Commission (CSLC), as discussed in Section 2.6 of the Initial Study.

Response to Comment 4-02

The wooly rose mallow (*Hibiscus lasiocarpos* var. *occidentalis*) is listed by the California Native Plant Society (CNPS) as a CRPR 1B.2 plant; it is not listed as threatened or endangered under the federal Endangered Species Act (ESA) or the California ESA. A technical description of the size of the shrub and flowers has been added to the Final Initial Study in Section 3.5.1. As discussed therein, the wooly rose-mallow is a small perennial herb (subshrub) approximately 3 to 6 feet in size. Therefore, a no-disturbance buffer of 25 feet will be outside of the leaf, flower, dripline, or root zone of any wooly rose-mallow plants, should they be present in the project site or vicinity. With Mitigation Measure BR-1, this will be a less-than-significant impact to the wooly rose-mallow. No additional mitigation is required.

Response to Comment 4-03

There are no staging areas located within 200 feet of an existing residence. The commenter refers to Figure 10, which shows a building within 30 feet of the staging area on the north bank; this building is the Bajamont WTP and is not a private residence. Some work may occur within 200 feet of existing residences on both the north and south bank project sites. This has been clarified in Section 3.13 of the Final Initial Study. However, Mitigation Measures N-1 through N-3 will still reduce all impacts to sensitive noise receptors to less-than-significant levels.

Response to Comment 4-04

Refer to **Response to Comment 2-01** for a discussion of the MMRP, included as **Appendix G** of this Final Initial Study.

Response to Comment 4-05

The record search conducted by the North Central Information Center (NCIC) of the California Historical Resources Information System (CHRIS) did not uncover any evidence of previously identified cultural resources within the submerged portions of the Proposed Project, and it is highly unlikely that submerged cultural resources are present within the project area. The American River in the project vicinity has a deeply scoured bed, as evidenced by the exposure of the abandoned pipeline that is being removed as a component of the Proposed Project; significant resources which might reasonably be expected to occur would consist of prehistoric sites or mining remnants. Prehistoric sites within submerged areas would likely be damaged or destroyed by the same scour effects that have exposed the CWD pipeline. Mining resources would be more substantial, but would be subject to settling as smaller materials were removed by fluvial action, potentially resulting in loss of integrity. In either case, it is unlikely that submerged cultural resources would retain the values that could make them eligible for listing on the National or California Registers.

Response to Comment 4-06

Comment noted. The title to archaeological sites and historic or cultural resources within the tide and submerged lands is vested in the State and is under the jurisdiction of the CSLC. Beyond those boundaries, the Proposed Project property ownership is divided between public and private owners.

Response to Comment 4-07

Comment noted.

Comment Letter 5 – Sacramento Municipal Utility District, March 9, 2015

Response to Comment 5-01

Utility crossings are addressed in the 90 Percent Drawings, included as **Appendix A** of the Initial Study. As shown therein, utility crossings do not encroach on existing easements other than to cross them perpendicularly with more than 12 inches vertical clearance. There will be no increase or decrease in electrical loads as a result of the Proposed Project. No electrical equipment will be installed other than one new water meter, which will not have a significant impact on energy efficiency. No transmission routing is included in the Proposed Project. Potential impacts of the Proposed Project to climate change are discussed in Section 3.8 of the Initial Study. No significant impacts to greenhouse gas emissions will result from implementation of the Proposed Project.

APPENDIX G

MITIGATION, MONITORING, AND REPORTING PLAN

Appendix G
Mitigation Monitoring and Reporting Plan

Mitigation Measure	Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
AIR QUALITY			
AQ-1 The following BMPs shall be implemented by the project applicant: ▪ Water exposed graded surfaces twice a day or as needed to address dust during construction. All material excavated, stockpiled, or graded should be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. ▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent streets. ▪ Limit traffic speeds on unpaved roads to 15 miles per hour (mph). ▪ Suspend grading activity when winds (instantaneous gusts) exceed 25 mph. ▪ Implement adequate dust control measures in a timely and effective manner during all phases of construction.	CWD	Construction	
BIOLOGICAL RESOURCES			
BR-1 Prior to construction activities beginning within 50 feet of the south and north banks of the American River, a qualified biologist or botanist shall conduct a preconstruction survey for the wooly rose-mallow in the evident and identifiable bloom season. If no wooly rose-mallow plants are identified, no further mitigation is required. Should a wooly rose-mallow be identified within 25 feet of construction activities, the qualified biologist shall establish and flag a 25-foot no disturbance buffer around the plant(s). No equipment staging shall be allowed within the buffer.	CWD	Prior to Construction	
BR-2 For the protection of Valley elderberry longhorn beetle, high-visibility, orange construction fencing shall be installed along the existing road edge that will restrict access to the two elderberry shrubs that are located within the Action Area. No equipment storage or other construction activity will occur within the vicinity of the elderberry shrubs outside of the existing road.	CWD	Prior to Construction	
BR-3 During construction activities associated with pipeline construction beneath the American River, as well as staging and operation of equipment associated	CWD	Construction	

	Mitigation Measure	Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
	with the pipeline, the following protective measures shall be followed: ▪ All construction activities associated with the new pipeline alignment shall occur outside of the American River channel and riparian corridor. Horizontal directional drilling shall be utilized to construct the new pipeline alignment 85 feet below the channel bottom. ▪ Avoidance measures to protect direct/indirect effects to riparian habitat shall include the establishment and maintenance of appropriate buffer zones along the adjoining riparian corridor outside the project site. Buffer zones shall be delineated using orange construction fencing. No equipment storage or other construction activity shall occur within the riparian buffer zones. ▪ A Stormwater Pollution Prevention Plan (SWPPP) utilizing best management practices (BMPs) shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat. ▪ A CDFW-approved frac-out contingency plan for horizontal directional drilling shall be prepared and implemented by the drilling contractor to minimize the potential for frac-out, provide early detection of frac-outs, protect aquatic resources, and provide notification to CDFW immediately if a frac-out event is observed. ▪ All equipment re-fueling and maintenance shall occur in an approved staging area outside of the riparian zone and an agency-approved spill prevention plan will implemented by the contractor. ▪ The construction of the pipeline shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.			
BR-4	During construction activities associated with culvert replacement in the unnamed drainage, the following protective measures shall be followed: ▪ The discharge flow from the Aerojet GET LB facility will either be turned off or diverted through a temporary pipeline directly into the American River during culvert replacement, re-grading, and pool creation to prevent erosion and siltation. ▪ All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-	CWD	Construction	

Mitigation Measure	Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
approved spill prevention plan will be implemented by the contractor. ▪ The culvert replacement shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during culvert replacement. ▪ The culvert replacement shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.			
BR-5 During construction activities associated with removal of the concrete vaults from the north bank of the American River, the following protective measures shall be followed: ▪ Removal of the concrete vaults shall occur between September 1 and October 15, when the flows in the American River are at their lowest seasonal levels (typically between 500 and 1,500 cfs) and after Central Valley steelhead egg and fry life stages are completed. ▪ Bank stabilization measures shall be implemented immediately after removal of the concrete vaults to prevent erosion. These measures include, but are not limited to, grading to reduce the bank gradient, installation of erosion blankets, and re-vegetating with native riparian plant species. ▪ All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-approved spill prevention plan will be implemented by the contractor. ▪ The concrete vault removal shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during vault removal. ▪ The removal of the concrete vaults shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.	CWD	Construction	
BR-6 During removal of the abandoned pipeline across the American River, the following protective measures shall be followed:	CWD	Construction	

Mitigation Measure	Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
▪ Removal of the existing pipeline shall occur between September 1 and October 15, when the flows in the American River are at their lowest seasonal levels (typically between 500 and 1,500 cfs) and after Central Valley steelhead egg and fry life stages are completed and therefore will not be adversely affected by removal of the existing pipeline. ▪ Consultation with NMFS, CDFW, and the Central Valley RWQCB shall occur to determine the BMPs required to minimize disturbance and mobilization of sediment during the abandoned pipeline removal. BMPs may include but are not limited to moveable silt or sediment containment curtains and coffer dams. ▪ The abandoned pipeline shall be cut where it emerges from the banks and will either be lifted by crane or chained and dragged from the river channel from the staging area on the south bank. Similarly, nearshore concrete debris will lifted by crane or dragged from the river channel from staging areas on the north and south banks. To the extent feasible, no equipment will be operated within the wetted channel. To help ensure that work in the immediate vicinity of the bank does not result in sediment discharge into the American River, coffer dams may be utilized during the pipeline and debris removal activities. ▪ A qualified biological monitor shall be present on-site during the pipeline removal. ▪ All equipment re-fueling and maintenance shall occur off-site or in an approved staging area outside of the riparian zone, and an agency-approved spill prevention plan will be implemented by the contractor. ▪ The pipeline removal shall be covered under the SWPPP prepared for the project, and BMPs shall be implemented to minimize the potential for sediments or other pollutants to enter aquatic habitat during pipeline removal. ▪ The removal of the abandoned pipeline shall require permits from USACE, Central Valley RWQCB, CDFW, and CSLC, and all terms of those permits, in addition to those specified in this BA, shall be followed.			

Mitigation Measure		Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
BR-7	A qualified biologist shall conduct a preconstruction survey for western pond turtle within 14 days prior to commencement of construction activities anticipated to occur within 100 feet from riparian vegetation adjacent to the American River and unnamed drainage along the north bank. Prior to commencement of daily construction activities within a 100-foot buffer of riparian vegetation adjacent to the American River and unnamed drainage, a qualified biologist shall conduct a preconstruction survey for western pond turtle. If western pond turtle is present, the biologist shall move the species from the work site before work activities begin. A biological monitor shall be present during construction activities within a 100-foot buffer of riparian vegetation surrounding the American River and unnamed drainage. The western pond turtle may take refuge in cavity-like and den-like structures such as pipes and may enter stored pipes and become trapped; therefore, all construction pipes, culverts, or similar structures that are stored at the construction site for one or more overnight periods shall be either securely capped prior to storage or thoroughly inspected by the biological monitor for these animals before the pipe is subsequently buried, capped, or otherwise used or moved.	CWD	Prior to Construction	
BR-8	If tree and shrub trimming/ removal activities are conducted during the breeding seasons of any migratory birds (generally between late May and August), a qualified biologist shall conduct a preconstruction survey within 14 days prior to commencement of any construction activities to determine if active nests are present. A report shall be prepared and submitted to the Carmichael Water District following the preconstruction survey to document the results. If surveys show that there is no evidence of nests, then no additional mitigation will be required provided construction commences within 14 days prior to the preconstruction survey.	CWD	Construction	
BR-9	Following a preconstruction nesting bird survey, if any active nests of cuckoos or other migratory birds are located within the vicinity of the Action Area, a no-disturbance buffer zone shall be established around the nests to avoid disturbance or destruction of the nest. The distance around the no-disturbance buffer shall be determined by the biologist in coordination with USFWS and CDFW and will depend on the level of noise or construction	CWD	Prior to Construction	

Mitigation Measure		Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
	activity, the level of ambient noise in the vicinity of the nest, and line-of-sight between the nest and disturbance. The biologist shall delimit the buffer zone with construction tape or pin flags. The no-disturbance buffer will remain in place until after the nesting season (to be lifted August-September) or until the biologist determines that the young birds have fledged. A report shall be prepared and submitted to the Carmichael Water District, USFWS, and CDFW following the fledging of the nestlings to document the results.			
CULTURAL RESOURCES				
CR-1	The District shall require that, in the event of any inadvertent discovery of archaeological resources, all such finds shall be subject to PRC 21083.2 and CEQA Guidelines 15064.5. All work within 50 feet of the find will be halted until a qualified professional archaeologist can evaluate the significance of the find in accordance with NRHP and California Register of Historical Resources (CRHR) criteria. Work shall not resume in the vicinity of the find until any required mitigation has been completed.	CWD	Construction	
CR-2	If vertebrate fossils are discovered during project activities, all work shall cease within 100 feet of the find until a qualified professional paleontologist as defined by the Society of Vertebrate Paleontology's Conformable Impact Mitigation Guidelines Committee (2011) can assess the nature and importance of the find and recommend appropriate treatment. The District will also be notified of the discovery and the qualified professional paleontologist's opinion within 48 hours of the initial finding. Treatment may include preparation and recovery of fossil materials, so that they can be housed in an appropriate museum or university collection, and also may include preparation of a report for publication describing the finds. Project activities shall not resume until after the qualified professional paleontologist has given clearance and evidence of such clearance has been submitted to the District.	CWD	Construction	
CR-3	If human remains are uncovered, compliance with Section 15064.5 (e) (1) of the CEQA Guidelines and Public Resources Code Section 7050.5 will be required. All project-related ground disturbances within 100 feet of the find shall be halted until the Sacramento County coroner has been notified in accordance with California Health and Safety Code Section 7050. If the	CWD	Construction	

Mitigation Measure		Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
	coroner determines that the remains are Native American, the coroner will ask the NAHC to identify a Most Likely Descendant, who will work with the construction contractor, agency officials, and a qualified professional archaeologist to determine an appropriate avoidance strategy or other treatment plan. Project-related ground disturbance in the vicinity of the find shall not resume until the process detailed in Section 15064.5 (e) has been completed.			
GEOLOGY AND SOILS				
GS-1	The project applicant shall comply with all recommendations contained within the site-specific Geotechnical Investigation conducted by Kleinfelder (2014) and attached here as Appendix C.	CWD	Construction	
GS-2	The District shall comply with the SWRCB NPDES General Permit. The SWRCB requires that all construction sites have adequate control measures to reduce the discharge of sediment and other pollutants to streams to ensure compliance with Section 303 of the CWA. To comply with the NPDES permit, the District shall file a Notice of Intent with the SWRCB and prepare a SWPPP prior to construction, which includes a detailed, site-specific listing of the potential sources of stormwater pollution; pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills) including a description of the type and location of erosion and sediment control BMPs to be implemented at the project site; and a BMP monitoring and maintenance schedule to determine the amount of pollutants leaving the Proposed Project site. A copy of the SWPPP must be current and remain on the project site. Control measures are required prior to and throughout the rainy season. Water quality BMPs identified in the SWPPP could include, but are not limited to, the following: ▪ Areas where ground disturbance would occur shall be identified in advance of construction and limited to only approved areas. ▪ All equipment maintenance and cleaning shall be confined to staging areas. See **Figure 3** for the location of potential staging areas. ▪ All supervisory construction personnel shall be informed of environmental	CWD	Construction	

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concerns, permit conditions, and final project specifications. Said personnel will be responsible for instructing all on-site work to meet the requirements of the SWPP including making sure all work is conducted outside of protected trees' drip lines to the extent possible. ▪ Restore disturbed areas to pre-construction contours to the fullest extent possible. ▪ Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) shall be employed for disturbed areas. ▪ Salvage, store, and use the highest quality soil for native re-vegetation/seeding. ▪ Leave drainage gaps in topsoil and spoil piles to accommodate surface water runoff. ▪ Sediment control measures shall be in place prior to the onset of the rainy season and will be maintained until disturbed areas have been re-vegetated. Erosion control structures must be in place and operational at the end of each day if work activities are to occur during the rainy season. ▪ Fiber rolls shall be placed along the perimeter of disturbed areas to ensure sediment and other potential contaminants of concern are not transported off-site or to open trenches. Locations of fiber rolls will be field adjusted as needed and according to the advice of the certified SWPPP inspector. ▪ Vehicles and equipment stored in the construction staging area shall be inspected regularly for signs of leakage. Leak-prone equipment will be staged over an impervious surface or other suitable means will be provided to ensure containment of any leaks. Vehicle/equipment wash waters or solvents will not be discharged to surface waters or drainage areas. ▪ During the wet season (October 1 through April 30) identified in Section 11 of the Sacramento County Improvement Standards, soil stockpiles and material stockpiles will be covered and protected from the wind and precipitation. Plastic sheeting will be used to cover the stockpiles and straw wattles will be placed at the base for perimeter control.			

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▪ All contractors shall immediately control the source of any leak and immediately contain any spill utilizing appropriate spill containment and countermeasures. All leaks and spills shall be reported to the designated representative of the lead contractor and shall be evaluated to determine if the spill or leak meets mandatory SWPPP reporting requirements. Contaminated media shall be collected and disposed of at an off-site facility approved to accept such media. ▪ Construction activities shall be scheduled to minimize land disturbance during peak runoff periods and to the immediate area required for construction. Soil conservation practices shall be completed during the fall or late winter to reduce erosion during spring runoff. Existing vegetation will be retained where possible. To the extent feasible, grading activities shall be limited to the immediate area required for construction. ▪ Topsoil removed during construction shall be carefully stored and treated as an important resource. Berms shall be placed around topsoil stockpiles to prevent runoff during storm events. ▪ Disturbed areas will be re-vegetated after completion of construction activities.			
HAZARDS & HAZARDOUS MATERIALS			
HM-1 Personnel shall follow written Standard Operating Procedures (SOPs) for filling and servicing construction equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving hazardous materials, shall include the following: ▪ Refueling shall be conducted only with approved pumps, hoses, and nozzles; ▪ Catch pans shall be placed under equipment to catch potential spills during servicing; ▪ All disconnected hoses shall be placed in containers to collect residual fuel from the hose; ▪ Vehicle engines shall be shut down during refueling;	CWD	Construction	

Mitigation Measure		Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
	▪ No smoking, open flames, or welding shall be allowed in refueling or service areas; ▪ Refueling shall be performed away from bodies of water to prevent contamination of water in the event of a leak or spill; ▪ Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents; ▪ Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with local, State, and Federal regulations; ▪ All containers used to store hazardous materials shall be inspected at least once per week for signs of leaking or failure. All maintenance and refueling areas shall be inspected monthly. Results of inspections shall be recorded in a logbook that would be maintained on site; and ▪ The amount of hazardous materials used in project construction and operation shall be consistently kept at the lowest volumes needed.			
HM-2	If suspected soil contamination is encountered during excavation, all work shall be halted and a qualified individual, in consultation with the RWQCB, shall determine the appropriate course of action.	CWD	Construction	
HM-3	During construction, staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a firebreak.	CWD	Construction	
HM-4	Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles and heavy equipment.	CWD	Construction	
NOISE				
N-1	On the north bank of the American River (in Sacramento County), construction shall only occur between the hours of 6 a.m. and 8 p.m. Monday through Friday, and 7 a.m. to 8 p.m. on Saturday and Sunday. On the south bank portion of the project site (in the City of Ranch Cordova), construction activities shall be limited to the hours of 7:00 a.m. to 7:00 p.m. weekdays and	CWD	Construction	

Mitigation Measure		Responsible Party for Monitoring / Reporting	Timing of Action	Verification (Date and Initials)
	8:00 a.m. to 6:00 p.m. weekends.			
N-2	Construction contractors shall use power construction equipment with state-of-the-art noise muffling devices. All internal combustion engines used on the project site shall be equipped with adequate mufflers and shall be in good mechanical condition to minimize noise created by faulty or poor maintained engines or other components.	CWD	Construction	
N-3	Construction contractors shall locate stationary noise generating equipment as far as possible from sensitive receptors. Staging areas shall be located a minimum of 200 feet from noise sensitive receptors, such as residential uses.	CWD	Construction	
TRANSPORTATION/TRAFFIC				
T-1	The District shall obtain an Encroachment Permit from the City of Rancho Cordova Public Works Department prior to project construction that will result in lane closures of any public roads. The Applicant shall abide by the terms of the permit, including the requirements for preparation of a traffic control plan.	CWD	Construction	
T-2	If construction equipment or construction activities will impede access on the American River Bike Trail, result in temporary closures, or otherwise affect the safety of cyclists and pedestrians in the area, the District shall provide signage and alternative routes, if appropriate, to ensure the safety of cyclists and pedestrians.	CWD	Construction	