Draft Environmental Impact Report for the

# Lathrop Consolidated Treatment Facility Surface Water Discharge Project

State Clearinghouse No. 2019110339

Prepared for

City of Lathrop

October 2020

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# TABLE OF CONTENTS

## Appendices



## Figures

## Tables

# LIST OF ABBREVIATIONS

| | |
|---|---|
| °C | degrees Celsius |
| °F | degrees Fahrenheit |
| µg/L | micrograms per liter |
| µmhos/cm | micromhos per centimeter |
| µPa | microPascal |
| 2013 CTF IS/MND | *City of Lathrop Consolidated Treatment Facility Initial Study/Mitigated Negative Declaration* |
| 2017 Scoping Plan | *California's 2017 Climate Change Scoping Plan* |
| | |
| AAQS | ambient air quality standard |
| AB | Assembly Bill |
| ADWF | average dry weather flow |
| AFV | alternative fuel vehicle |
| | |
| Basin Plan | *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* |
| Bay-Delta Plan | *Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary* |
| BMI | benthic macroinvertebrate |
| BMP | best management practice |
| BOD | biological oxygen demand |
| BPS | best performance standard |
| | |
| CAA | federal Clean Air Act |
| CAAQS | California ambient air quality standards |
| CAFE | corporate average fuel economy |
| CAL FIRE | California Department of Forestry and Fire Protection |
| Cal/OSHA | California Occupational Safety and Health Administration |
| Cal-ARP | California Accidental Release Prevention |
| CalEEMod | California Emissions Estimator Model |
| CalEPA | California Environmental Protection Agency |
| Caltrans | California Department of Transportation |
| CARB | California Air Resources Board |
| CCAA | California Clean Air Act |
| CCR | California Code of Regulations |
| CDBM | chlorodibromomethane |
| CDFW | California Department of Fish and Wildlife |
| CEC | California Energy Commission |
| CEC | constituents of emerging concern |
| Central Valley RWQCB | Central Valley Regional Water Quality Control Board |
| CEQA Guide | *Guide for Assessing and Mitigating Air Quality Impacts* |

| | |
|---|---|
| CEQA | California Environmental Quality Act |
| CESA | California Endangered Species Act |
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| CHP | California Highway Patrol |
| CHRIS | California Historical Resources Information System |
| CIP | capital improvement project |
| City | City of Lathrop |
| CLSP | Central Lathrop Specific Plan |
| CNDDB | California Natural Diversity Database |
| CO | carbon monoxide |
| $CO_2$ | carbon dioxide |
| CRHR | California Register of Historical Resources |
| CSLC | California State Lands Commission |
| CTF | Consolidated Treatment Facility |
| CTR | California Toxics Rule |
| CUPA | Certified Unified Program Agencies |
| CVC | California Vehicle Code |
| CVFPB | Central Valley Flood Protection Board |
| CVFPP | Central Valley Flood Protection Plan |
| CVP | Central Valley Project |
| CWA | Clean Water Act |
| | |
| dB | decibels |
| DCBM | dichlorobromomethane |
| DDD | Dichlorodiphenyldichloroethane |
| DDT | dichlorodiphenyltrichloroethane |
| Delta | Sacramento–San Joaquin Delta |
| diesel PM | particulate matter exhaust from diesel engines |
| DOC | dissolved organic carbon |
| DPS | distinct population segment |
| Draft EIR | draft environmental impact report |
| DSC | Delta Stewardship Council |
| DSM2 | Delta Simulation Model II |
| DTSC | California Department of Toxic Substances Control |
| DWR | California Department of Water Resources |
| DWSC | Deep Water Ship Channel |
| | |
| EC | electrical conductivity |
| EDC | endocrine-disrupting compounds |
| EFH | essential fish habitat |
| EGU | electric generating unit |

| | |
|---|---|
| EO | Executive Order |
| EOP | Emergency Operations Plan |
| EPA | U.S. Environmental Protection Agency |
| EPAct | Energy Policy Act of 1992 |
| EPCRA | Emergency Planning and Community Right-to-Know Act of 1986 |
| ESA | federal Endangered Species Act |
| ESU | evolutionarily significant unit |
| | |
| fps | feet per second |
| FR | Federal Register |
| FTA | Federal Transit Administration |
| | |
| GHG | greenhouse gas |
| GWP | global warming potential |
| | |
| HAP | hazardous air pollutant |
| HMBP | Hazardous Materials Business Plan |
| hp | horsepower |
| HRI | heat rate improvement |
| Hz | hertz |
| | |
| I-5 | Interstate 5 |
| IEPR | integrated energy policy report |
| in/sec | inches per second |
| IPaC | Information for Planning and Consultation |
| IPCC | Intergovernmental Panel on Climate Change |
| IWRMP | Integrated Water Resources Master Plan |
| | |
| LAA | land application area |
| lb/day | pounds per day |
| $L_{eq}$ | Equivalent Continuous Sound Level |
| LF | linear feet |
| $L_{max}$ | Maximum Sound Level |
| LOF | Libby-Owens Ford Company |
| | |
| Magnuson-Stevens Act | Magnuson-Stevens Fishery Conservation and Management Act |
| Manteca | City of Manteca |
| MBTA | Migratory Bird Treaty Act |
| MCL | maximum contaminant level |
| MG | million gallons |
| mg/L | milligrams per liter |
| mgd | million gallons per day |

| | |
|---|---|
| $MMTCO_2e$ | million metric tons of carbon dioxide equivalent |
| $MTCO_2e$ | metric tons of carbon dioxide equivalent |
| | |
| NAAQS | national ambient air quality standards |
| NAHC | Native American Heritage Commission |
| Natural Investigations | Natural Investigations Company |
| NCCP | natural community conservation plan |
| ng/L | nanograms per liter |
| NHPA | National Historic Preservation Act |
| NMFS | National Oceanic and Atmospheric Administration National Marine Fisheries Service |
| NO | nitric oxide |
| $NO_2$ | nitrogen dioxide |
| $NO_X$ | oxides of nitrogen |
| NPDES | National Pollutant Discharge Elimination System |
| NRHP | National Register of Historic Places |
| NTR | National Toxics Rule |
| | |
| OCAP | Operations and Coordinated Actions Plan |
| OES | Office of Emergency Services |
| OHWM | ordinary high-water mark |
| OPR | Governor's Office of Planning and Research |
| OSHA | Occupational Safety and Health Administration |
| | |
| PCB | polychlorinated biphenyl compounds |
| PFOA | perfluorooctanoic acid |
| PFOS | perfluorooctane sulfonic acid |
| PG&E | Pacific Gas and Electric Company |
| PM | particulate matter |
| $PM_{10}$ | respirable particulate matter with an aerodynamic diameter of 10 micrometers or less |
| $PM_{2.5}$ | fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less |
| POD | Pelagic Organism Decline |
| PPCP | pharmaceutical and personal care products |
| PPV | peak particle velocity |
| PRC | Public Resources Code |
| PVC | polyvinyl chloride |
| | |
| RCP | Representative Concentration Pathway |
| RD 17 | Reclamation District 17 |
| RD | Reclamation District |
| RMS | root-mean-square |
| ROG | reactive organic gases |
| RWQCB | regional water quality control board |

| | |
|---|---|
| SAFE Rule | Safer Affordable Fuel-Efficient Vehicles Rule |
| SB | Senate Bill |
| SCH | State Clearinghouse |
| SJCDEH | San Joaquin County Department of Environmental Health |
| SJCOG | San Joaquin Council of Governments |
| SJMSCP | *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan* |
| SJVAB | San Joaquin Valley Air Basin |
| SJVAPCD | San Joaquin Valley Air Pollution Control District |
| $SO_2$ | sulfur dioxide |
| $SO_X$ | oxides of sulfur |
| SPCC rule | Spill Prevention, Control, and Countermeasure rule |
| SPL | sound pressure level |
| SRWTP | Sacramento Regional Wastewater Treatment Plant |
| SVP | Society of Vertebrate Paleontology |
| SWP | State Water Project |
| SWPPP | Stormwater Pollution Prevention Plan |
| SWRCB | California State Water Resources Control Board |
| | |
| TCR | tribal cultural resources |
| TDS | total dissolved solid |
| Thermal Plan | Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California |
| TMDL | total maximum daily loads |
| tpy | tons per year |
| TSS | total suspended solids |
| | |
| UCMP | University of California Museum of Paleontology |
| UFP | Ultrafine particulate matter |
| UPRR | Union Pacific Railroad |
| USACE | U.S. Army Corps of Engineers |
| USC | U.S. Code |
| USFWS | U.S. Fish and Wildlife Service |
| UST | underground storage tanks |
| | |
| VdB | vibration decibels |
| VMT | vehicle miles traveled |
| | |
| WDR | Waste Discharge Requirement |
| WERF | Water Environment Research Foundation |
| WQCF | Water Quality Control Facility |
| WWTP | Wastewater Treatment Plant |

# EXECUTIVE SUMMARY

## ES.1 INTRODUCTION

This summary is provided in accordance with California Environmental Quality Act Guidelines (State CEQA Guidelines) Section 15123. As stated in Section 15123(a), "an EIR [environmental impact report] shall contain a brief summary of the proposed action and its consequences. The language of the summary should be as clear and simple as reasonably practical." As required by the guidelines, this chapter includes (1) a summary description of the proposed Lathrop Consolidated Treatment Facility (CTF) Surface Water Discharge Project (proposed project), (2) a synopsis of environmental impacts and recommended mitigation measures (Table ES-1), (3) identification of the alternatives evaluated and of the environmentally superior alternative, and (4) a discussion of the areas of controversy associated with the project.

## ES.2 SUMMARY DESCRIPTION OF THE PROJECT

### ES.2.1 Project Location

Elements of the proposed project would be constructed (1) at the City's existing CTF, located on 54 acres of City-owned land at 18800 Christopher Way, Lathrop, CA; (2) along roadways in Lathrop between the CTF and the San Joaquin River, including Tesla Way, Harlan Road, and Inland Passage Way; and (3) along the right bank of the San Joaquin River, approximately 0.7 mile downstream of the I-5 overcrossing, at approximately river mile 55.8 (Figure 2-4 in Chapter 2, "Project Description").

### ES.2.2 Background and Need for the Project

Wastewater from the City of Lathrop is treated at two separate facilities: the City of Manteca (Manteca) Water Quality Control Facility (WQCF) and the CTF. The Manteca WQCF treats most of the wastewater generated in the City east of I-5 and north of Louise Avenue, and the CTF treats domestic and a relatively small amount of commercial wastewater from the master planned communities in the western portion of the City and commercial and industrial wastewater from the Crossroads Commercial Center area, South Lathrop, and Lathrop Gateway Business Park (Figure 2-1 in Chapter 2, "Project Description"). Treated wastewater effluent from the Manteca WQCF is primarily disposed of by discharge to the San Joaquin River at river mile 57. Treated wastewater effluent from the CTF is stored in aboveground lined ponds and used for public landscape and agricultural irrigation in the City or disposed of in a percolation basin (Figure 2-2 in Chapter 2).

The CTF produces treated effluent that meets the requirements for disinfected tertiary recycled water in accordance with Title 22 of the CCR (Title 22, Division 4, Chapter 3). CTF effluent disposal and reuse is regulated by the Central Valley Regional Water Quality Control Board (Central Valley RWQCB) under Waste Discharge Requirements (WDRs) and Master Recycling Permit Order No. R5-2016-0028-01. Under the WDRs, the City may store disinfected tertiary treated CTF effluent in aboveground lined storage ponds before pumping it to the distribution system for irrigation of agricultural land application areas (LAAs) and public landscape areas and disposal in a percolation basin (PB-1).

The CTF has an existing design treatment capacity of 2.5 million gallons per day (mgd) average dry weather flow (ADWF), and the recycled water system provides about 666 million gallons per year of disposal capacity, or approximately 1.69 mgd ADWF via application to nine agricultural LAAs and the various public landscaping areas throughout River Islands and disposal in PB-1. Therefore, the CTF's maximum discharge capability is limited by the currently permitted disposal capacity of 1.69 mgd ADWF (Central Valley RWQCB 2019). Lathrop has the right to 14.7 percent of the existing Manteca WQCF capacity by contract with Manteca, which is 1.45 mgd. Manteca is reserving its remaining capacity to serve future development in its jurisdiction.

The Lathrop General Plan designates most of the agricultural LAAs and all the storage ponds except S5 and S16, for commercial, residential, or urban development (Figure 2-3) (EKI 2019). Retaining this land for effluent storage and disposal would prevent development of the properties in accordance with the general plan land use designations. Additionally, effluent production at the CTF, during the low-irrigation/nonirrigation months of October through April in particular, is projected to exceed the City's available land-based effluent storage, reuse, and disposal capacity (RBI 2019:13–14).

The City is proposing to establish a direct discharge of CTF-generated and dechlorinated disinfected tertiary treated effluent to the San Joaquin River for use when generation of treated CTF effluent would exceed the capacity of the City's recycled water system to store and reuse treated effluent for landscape irrigation. The majority of CTF effluent would be discharged to the San Joaquin River during winter, when irrigation demands are low and river flow is relatively high, and less would be discharged during the irrigation season, when reuse of CTF recycled water would be maximized for landscape irrigation. This approach would allow land designated under the general plan for urban uses to be developed in accordance with the plan.

The City intends to obtain an initial National Pollutant Discharge Elimination System (NPDES) permit to discharge up to 2.5 mgd ADWF of dechlorinated treated effluent (current ADWF treatment capacity of the CTF) to the San Joaquin River. However, to accommodate buildout of the City and account for potential cumulative development, the analysis in this EIR evaluates the environmental impacts of wastewater generation and discharge of up to 2.5 and 5.2 mgd ADWF to the San Joaquin River under the proposed project, and considers the incremental contribution of future cumulative wastewater generation and discharge to the San Joaquin River of up to 6 mgd ADWF.

This EIR is tiered from, and incorporates by reference, the *City of Lathrop Consolidated Treatment Facility Initial Study/Mitigated Negative Declaration* (2013 CTF IS/MND) (City of Lathrop 2013), consistent with Section 15152 of the State CEQA Guidelines and Public Resources Code Section 21094. The 2013 CTF IS/MND provides project-level CEQA authorization for expansion of the CTF treatment capacity from 3.0 mgd to 6.0 mgd and program-level CEQA authorization for an additional 3.1 mgd of treatment capacity, for a total capacity of 9.1 mgd at the CTF. This EIR incorporates by reference the project-level environmental analysis of the CTF expansion, and applicable mitigation measures identified in the 2013 CTF IS/MND. The impacts of constructing and operating the proposed dechlorination system, effluent pipeline, and outfall are the focus of this EIR.

## ES.2.3 Project Objectives

The proposed project has the following objectives:

- Provide for planned City buildout and development based on the City's General Plan by providing effluent discharge to the San Joaquin River.
- Provide efficient and cost-effective wastewater services through buildout of the City.
- Maximize use of recycled water in the City presently and in the future.

## ES.2.4 Characteristics of the Project

The proposed project involves modifications to the CTF, installation of effluent pipelines, and construction of an effluent pipeline levee crossing and outfall structure (Figure 2-4 in Chapter 2, "Project Description). These elements of the proposed project are summarized below and described in detail in Chapter 2.

### CTF MODIFICATIONS (TO SUPPORT 2.5-MGD SURFACE WATER DISCHARGE)

The CTF uses chlorine to provide disinfection of treated effluent for discharge to the LAAs. However, effluent proposed to be discharged to the San Joaquin River would require dechlorination before discharge to be compliant with an NPDES Permit and to avoid adverse effects to aquatic species. Therefore, to allow continued distribution of chlorinated CTF effluent for recycled water use, as well as discharge of dechlorinated CTF effluent to the San Joaquin

River when effluent flows exceed demand for recycled water, the City is proposing to implement the following wastewater treatment system modifications (see Figure 2-6 in Chapter 2):

- Use of sodium bisulfite for dechlorination;
- Use of Storage Ponds A, B, and C to cool final effluent before river discharge, as needed;
- Installation of new connections between Pond S5 and PMP-1 and the Crossroads Pump Station;
- Installation of new pipelines, valves, monitoring equipment, and controls at the Crossroads Pump Station; and
- Connection of the Crossroads Pump Station to a new effluent discharge pipe to pump dechlorinated effluent to the river.

## EFFLUENT DISCHARGE PIPELINE (TO SUPPORT 2.5 MGD AND BUILDOUT SURFACE WATER DISCHARGE)

The proposed project requires a dedicated effluent discharge pipeline connecting the Crossroads Pump Station at the CTF to a new outfall along the San Joaquin River. The City would install a pipeline sufficiently sized to convey and discharge effluent associated with general plan buildout (see Figure 2-4 in Chapter 2), including the following:

- Installation of new effluent discharge pipeline from the Crossroads Pump station at the CTF along Tesla Way to its intersection with Harlan Road and continuing south along Harlan Road to approximately 30 feet north of the turnaround adjacent to I-5. This would require crossing a rail spur line along Tesla Way and capping an existing pipeline adjacent to Murphy Parkway upstream of its intersection with Tesla Way.
- Reuse of an existing steel pipe crossing under the freeway from Harlan Road to Sadler Oak Drive and continuing along Sadler Oak Drive to its intersection with Inland Passage Way.
- Installation of new effluent discharge pipeline from Sadler Oak Drive north along Inland Passage Way and then continuing to the toe of the Reclamation District (RD) 17 levee.
- Installation of a new valve system to allow manual diversion of stagnant water in the discharge pipeline to the Mossdale sewer system for return to the CTF headworks following periods of no discharge to the river.

## LEVEE CROSSING AND OUTFALL STRUCTURE (TO SUPPORT 2.5-MGD AND BUILDOUT SURFACE WATER DISCHARGE)

The proposed CTF outfall would be located along the right bank of the San Joaquin River on the waterside of an existing State Plan of Flood Control and Federal Flood Control Project levee maintained by RD 17. Construction of the proposed effluent pipeline across the levee and the new side-bank outfall would include the following (also see Figure 2-7 in Chapter 2):

- Installation of new welded steel pressurized pipe in an approximately 16-foot-wide trench excavated through the levee seepage berm and levee prism above the 200-year water surface elevation from the levee toe to the proposed outfall on the waterside of the levee.
- Extension of the new pipe to the river, and construction of a new concrete-encased outfall structure below the mean lower low water level and above the channel bed of the San Joaquin River at approximately river mile 55.8 to create a new side-bank outfall. The elevation of the pipe at the outfall location would be set to ensure discharge of effluent sufficiently low to achieve adequate mixing with river water such that an increase in ambient surface water temperature of no more than 4 degrees Fahrenheit would be observed at any time during the year.
- Installation of erosion protection material (e.g., articulated concrete block, riprap) above and below the headwall and extending upstream and downstream of the outfall to prevent scour.

## PROJECT OPERATIONS

Operation of the proposed project would utilize the newly automated CTF system to control the effluent river discharge and maximize reuse using the recycled water distribution system (Figure 2-9 in Chapter 2). In summer during peak demand for recycled water, chlorinated effluent would flow by gravity to Pond S5 and be used to supply the recycled water system. In late summer or early fall, when recycled water demands decrease, the Crossroads Pump Station would be activated as needed to discharge dechlorinated effluent in excess of recycled water demand to the river, which would allow water levels in the ponds to be lowered. During winter, when CTF inflow generally exceeds irrigation demand and river water temperatures are lower, most of the effluent would be dechlorinated, held temporarily in Ponds A, B, and C, or a subset of these, as needed, to provide effluent cooling, and then discharged via the Crossroads Pump Station to the river through the new effluent discharge pipe network. In spring, when minimum pond level setpoints are raised to maximize recycled water storage and reuse again, discharge of dechlorinated effluent to the river would be reduced, and chlorinated effluent would be directed from the chlorine contact basins to fill storage ponds in the recycled water system.

Implementing the proposed project would not require any changes to staffing at the CTF or to power, telecommunications, gas, water supply, recycled water distribution, or sewer infrastructure in the near term.

# ES.3 ALTERNATIVES TO THE PROPOSED PROJECT

This Draft EIR evaluates the No Project Alternative and two alternatives to the proposed project in Chapter 5, “Alternatives.” The following provides brief descriptions of the alternatives evaluated in this Draft EIR.

- **Alternative 1: No Project Alternative** assumes no surface water discharge infrastructure would be constructed. All wastewater would continue to be recycled and reused for landscape irrigation or disposed of via land application. This would require use of lands for storage and disposal that are currently designated for urban development in the City of Lathrop’s General Plan because acquisition of adequate storage and land application areas outside the City limits is infeasible. Thus, the City’s ability to develop consistent with its General Plan would be constrained under this alternative.
- **Alternative 2: Outfall Configuration Alternative** assumes that a bottom diffuser outfall would be constructed instead of the proposed side bank outfall at the currently proposed outfall location for the project.
- **Alternative 3: Manteca WQCF Outfall Location Alternative** assumes that all CTF effluent could be discharged at the Manteca WQCF outfall at river mile 57. (Note: The outfall for the proposed project would be located at river mile 55.8.) This would include construction of a discharge pipeline and future expansion of the Manteca outfall structure. The discharge pipeline route has not been specifically identified. However, it would require crossing the Union Pacific Railroad rail line and SR 120.

State CEQA Guidelines Section 15126.6(e)(2) suggests that an EIR should identify the “environmentally superior” alternative. “If the environmentally superior alternative is the ‘no project’ alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.” As described in Section 5.4.1, the No Project Alternative, or Alternative 1, would result in less impacts related to aquatic biological resources and hydrology and water quality and similar impacts related to terrestrial biological resources, cultural, tribal cultural, and paleontological resources, energy, and hazards and hazardous materials compared to the proposed project. However, impacts related to air quality, greenhouse gas emissions and climate change, and noise and vibration would be greater under the No Project Alternative than under the proposed project.

As described in Section 5.4.2, Alternative 2 would not avoid any potentially significant impacts of the proposed project, and would result in greater impacts related to air quality and aquatic biological resources than under the proposed project. As described in Section 5.4.3, Alternative 3 would result in less potential construction noise and vibration effects. However, Alternative 3 would result in greater impacts related to aquatic biological resources and water quality compared to the proposed project.

Because Alternative 1 would not allow growth in accordance with the Lathrop General Plan, and therefore, would not meet all of the objectives of the proposed project, and would introduce additional potentially significant impacts compared to the proposed project, the No Project Alternative would not be the environmentally superior alternative. Alternatives 2 and 3 would meet the project objectives similar to the proposed project. However, the proposed project would avoid additional potentially significant impacts that could be caused by Alternatives 2 and 3. Thus, the proposed project would be the environmentally superior action alternative.

# ES.4 AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

A notice of preparation (NOP) was distributed for the proposed project on November 18, 2019, to responsible agencies, interested parties, and organizations, as well as private organizations and individuals that may have an interest in the project. A public scoping meeting was held on December 4, 2019. The purpose of the NOP and the scoping meeting was to provide notification that an EIR was being prepared for the project and to solicit input on the scope and content of the environmental document. The NOP and responses to the NOP are included in Appendix A of this Draft EIR. Key concerns and issues that were expressed about the proposed project during the scoping process included the following:

- Consistency with the Delta Plan
- Consistency with the San Joaquin County Multi-species Habitat and Open Space Plan
- Potential to induce new development in the Delta not previously planned
- Impacts on RD 17 levees and planned levee improvements
- Potential impacts on tribal cultural resources and consultation with Native American tribes
- Potential for utility conflicts

These issues are each addressed in this Draft EIR. Any impacts related to these issues are either identified as less than significant, or less than significant after mitigation.

# ES.5 ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

## ES.5.1 Project-Specific Impacts

The EIR has been prepared pursuant to CEQA and the State CEQA Guidelines to evaluate the physical environmental effects of the proposed Lathrop CTF Surface Water Discharge Project. The City of Lathrop is the lead agency for the project. The City of Lathrop has the principal responsibility for approving and carrying out the project and for ensuring that the requirements of CEQA have been met. After the Final EIR is prepared and the EIR public-review process is complete, the Lathrop City Council is the party responsible for certifying that the EIR adequately evaluates the impacts of the project.

Impacts of the proposed project are summarized in Table ES-1, presented at the end of this chapter. The table provides the level of significance of the impact before mitigation, recommended mitigation measures, and the level of significance of the impact after implementation of the mitigation measures.

## ES.5.2 Significant-and-Unavoidable Impacts and Cumulative Impacts

As documented throughout Chapter 3 (project-level impacts) and Chapter 4, "Cumulative Impacts," of this Draft EIR, after implementation of the recommended mitigation measures, the significant and potentially significant impacts associated with the proposed Lathrop CTF Surface Water Discharge Project would be reduced to a less-than-significant level. The analysis concludes that the proposed project would not result in significant and unavoidable impacts.

**Table ES-1 Summary of Impacts and Mitigation Measures**

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|
| NI = No impact LTS = Less than significant PS = Potentially significant S = Significant SU = Significant and unavoidable | | | |
| Air Quality | | | |
| Impact 3.2-1: Result in Short-Term Emissions of Criteria Air Pollutants and Precursors<br>The proposed project would result in construction-related emissions of ROG, $NO_X$, CO, $SO_X$, $PM_{10}$, and $PM_{2.5}$ from use of off-road heavy-duty construction equipment. Project-generated construction emissions of criteria air pollutants would not exceed any SJVAPCD mass emissions thresholds. Consistent with SJVAPCD Regulation VIII (Fugitive $PM_{10}$ Prohibition), measures would be implemented to reduce construction-related $PM_{10}$ emissions (predominantly dust and dirt). Nonetheless, the proposed project would generate emissions in excess of SJVAPCD's daily mass emissions screening criteria, thus, this impact would be potentially significant. | PS | Mitigation Measure 3.2-1: Apply Tier-4 Emissions Standards to Achieve a 30-Percent Reduction in $NO_X$ Emissions from Diesel-Powered Off-Road Equipment<br>If project implementation requires two construction crews to construct the effluent discharge pipeline, the City shall require the construction contractor to use off-road construction equipment that meets EPA's Tier 4 emissions standards as defined in 40 Code of Federal Regulations. The construction equipment shall reduce construction emissions of $NO_X$ by 30 percent from the statewide average as estimated by CARB, such that $NO_X$ emissions do not exceed 100 lb/day. The construction contractor shall provide a plan for approval by the City that demonstrates that heavy-duty off-road vehicles (50 horsepower [hp] or more) to be used 8 hours or more during project construction achieve this 30-percent reduction. The plan shall have two components: an initial report submitted before construction and a final report submitted after project completion.<br>The initial report shall be submitted to the City prior to the issuance of grading permits and shall provide project and construction company information; and the equipment type, hp rating, engine model year, projected hours of use, and CARB equipment identification number for each piece of equipment in the plan. The final report shall document the end of the job, phase, or calendar year to demonstrate continued project compliance.<br>This requirement shall be applied to a future construction scenario that requires the use of two effluent discharge pipeline construction crews operating off-road heavy-duty equipment within the project site at the same time CTF modifications are being constructed. Future construction of the effluent discharge pipeline that could be implemented by one construction crew at the same time as CTF modifications are being constructed shall not be subject to the requirements of this mitigation measure. | LTS |
| Impact 3.2-2: Result in Operational Emissions of Criteria Air Pollutants and Precursors<br>The proposed project would not introduce new employee trips in the near term. In the long term, as evaluated in the 2013 CTF IS/MND, the Lathrop Water, Wastewater, and Recycled Water Master Plan could introduce an additional 10 one-way worker commute trips to a facility totaling less than 75,000 square feet. Based on SJVAPCD guidance, the proposed project would be below an SJVAPCD-defined "small project" and would not contribute operational emissions that could contribute to an exceedance of an air quality standard. Additionally, the proposed project would | LTS | No mitigation is required for this impact. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|
| NI = No impact LTS = Less than significant PS = Potentially significant S = Significant SU = Significant and unavoidable | | | |
| introduce a new one-fourth-hp pump, which would not support sufficient horsepower to be a notable stationary source requiring permitting oversight by SJVAPCD pursuant to Rule 2201. Emissions of Criteria Air Pollutants generated by operation of the proposed project would result in a less-than-significant impact. | | | |
| **Impact 3.2-3: Expose Sensitive Receptors to Emissions of Toxic Air Contaminants**<br>Construction-related emissions of TACs associated with the implementation of the proposed project would not result an incremental increase in cancer risk greater than 20 in one million or a hazard index greater than 1.0 at existing or future sensitive receptors. Therefore, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| Terrestrial Biological Resources | | | |
| **Impact 3.3-1: Cause Disturbance to or Loss of Valley Elderberry Longhorn Beetle**<br>Implementation of the proposed project may result in the direct removal of, direct damage to, or indirect damage to elderberry shrubs, which could result in mortality of the federally listed valley elderberry longhorn beetle, if present. This impact would be potentially significant. | PS | **Mitigation Measure 3.3-1a: Seek Coverage under the SJMSCP**<br>Prior to any project grading or vegetation removal, the City will seek coverage under the SJMSCP for authorized take and to mitigate habitat impacts on covered special-status species. Coverage involves compensation for habitat impacts on covered special-status species. Coverage also requires implementation of incidental take and minimization measures and payment of fees for conversion of habitat for covered special-status species. Fees paid may fund the preservation and/or creation of habitat in preserves to be managed in perpetuity. Obtaining coverage for a project includes incidental take authorization under Section 10(a) of the ESA, California Fish and Game Code Section 2081, and the MBTA. Coverage under the SJMSCP would fully mitigate all habitat impacts on covered special-status species that have no limitations to take coverage.<br>**Mitigation Measure 3.3-1b: Conduct Survey for and Protect Valley Elderberry Longhorn Beetle**<br>The City will implement the following measures, outlined in the SJMSCP, to avoid, minimize, and mitigate impacts on valley elderberry longhorn beetle:<br>a) A qualified biologist will be retained by the City to conduct a preconstruction survey to count and measure elderberry stems and determine whether valley elderberry longhorn beetle exit holes are present before implementation of the project for all elderberry shrubs within or adjacent to the project footprint.<br>b) The following measures will be implemented for all elderberry shrubs that will be retained on the project site:<br>▸ A construction setback of 20 feet from the dripline of each elderberry shrub/cluster will be established. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
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| | | ▶ Brightly colored flags and/or fencing will be placed around elderberry shrubs as close as possible to construction limits during project activities.<br>▶ Measures will be implemented during ground-disturbing activities on the project site to avoid altering the hydrology of the site or otherwise affecting the vigor or likelihood of survival of elderberry shrubs.<br>▶ The City and its construction contractor will ensure that project activities, such as truck traffic or other use of machinery, do not create excessive dust on the project site, such that the growth or vigor of elderberry shrubs is adversely affected. Enforcing a speed limit and watering dirt roadways are examples of methods that may be used to ensure that excessive dust is not created.<br>▶ Areas that are disturbed temporarily will be restored to predisturbance conditions (e.g., matching preconstruction contours, slopes, and drainage patterns). Erosion control measures (e.g., use of hay bales, filter fences, or other accepted equivalents) will be installed around disturbed areas within 100 feet of the dripline of elderberry shrubs.<br>▶ No insecticides, herbicides, fertilizers, or other chemicals will be used within 100 feet of the dripline of elderberry shrubs.<br>c) The following measures will be implemented for any elderberry shrubs that cannot be avoided and removed from the project site:<br>▶ All elderberry shrubs with evidence of valley elderberry longhorn beetle exit holes (as determined during the preconstruction survey) that cannot be avoided during project construction will be transplanted by the City to a USFWS-approved valley elderberry longhorn beetle mitigation site during the dormant period for elderberry shrubs (November 1 through February 15).<br>▶ If elderberry shrubs with evidence of valley elderberry longhorn beetle exit holes cannot be transplanted, the City will provide mitigation within SJMSCP preserves at a ratio of three new plants for each stem 1 inch in diameter or greater (as determined during the preconstruction survey) to be removed from the project site.<br>▶ For all elderberry shrubs without exit holes that cannot be avoided during project construction, the City will provide mitigation within SJMSCP preserves at a ratio of three new plants for each stem 1 inch in diameter or greater (as determined during the preconstruction survey) to be removed from the project site. | |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
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| **Impact 3.3-2: Cause Disturbance to or Loss of Western Pond Turtle**<br>Implementation of the proposed project would include construction within the San Joaquin River and its levee. These project components may result in disturbance to or direct loss of western pond turtle if it is present within aquatic and upland habitat. This impact would be potentially significant. | PS | **Mitigation Measure 3.3-2: Conduct Western Pond Turtle Preconstruction Survey and Relocation**<br>The City will implement the following measures to avoid potentially significant impacts on western pond turtle, consistent with the avoidance and minimization measures in the SJMSCP. All mitigation listed below will be limited to construction within 0.3 mile of suitable aquatic habitat:<br>▶ A preconstruction survey for western pond turtle shall be conducted by a qualified biologist before work is conducted in aquatic habitat suitable for the species. If no pond turtles are observed, no further mitigation is necessary.<br>▶ During coffer dam installation and draining of the proposed new outfall location, a qualified biologist shall be present to survey for western pond turtles. If pond turtles are observed, a qualified biologist, with approval from CDFW, shall relocate pond turtles to the nearest area with suitable aquatic habitat that will not be disturbed by project-related construction activities.<br>▶ If nesting areas for pond turtles are identified on the project site, a buffer area of 300 feet shall be established around the nesting site (which may be immediately adjacent to the river or extend up to 400 feet away from the river in uplands). These buffers shall be indicated by temporary fencing if construction has or will begin before nesting periods have ended. (The period from egg laying to emergence of hatchlings is normally April to November.) | LTS |
| **Impact 3.3-3: Cause Disturbance to or Loss of Swainson's Hawk, White-Tailed Kite, Cooper's Hawk, Sharp-Shinned Hawk, and Other Nesting Raptors**<br>Although construction of most of the proposed project would occur within already developed areas, implementation of the proposed project could include tree removal and would include removal of other vegetation and work in proximity to known active nests. These activities may result in disturbance to nesting Swainson's hawk, white-tailed kite, and other nesting raptors, potentially resulting in nest abandonment, failure, or mortality of chicks and eggs. This impact would be potentially significant. | PS | **Mitigation Measure 3.3-3: Protect Swainson's Hawk, White-Tailed Kite, Cooper's Hawk, Sharp-Shinned hawk, and Other Nesting Raptors**<br>The City will implement the following measures consistent with the SJMSCP to avoid, minimize, and mitigate impacts on Swainson's hawk, white-tailed kite, Cooper's hawk, sharp-shinned hawk, and other nesting raptors:<br>▶ Although no tree removals are anticipated, if removal of a known nest tree is required, it shall be removed between September 16 and February 14. If removal of the tree occurs between November 1 and February 14, a qualified biologist will be retained to conduct a preactivity survey of the tree because great horned owls start nesting early and could occupy hawk nests early in the season.<br>▶ If project activity would commence between February 15 and September 15, a qualified biologist will be retained to conduct preconstruction surveys for active nests on and within 0.5 mile of the project site no more than 14 days and no less than 7 days before work begins. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
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| | | ▶ If an occupied nest is present, CDFW guidelines recommend implementation of 0.25-mile buffer for Swainson's hawk in developed areas and a 500-foot buffer for other raptors, but the size of the buffer may be adjusted if a qualified biologist and CDFW determine that reducing the buffer size would not be likely to adversely affect the nest. No project activity will commence within the buffer area until a qualified biologist confirms that the nest is no longer active or that the young have fully fledged. Monitoring of the nest by a qualified biologist will be required if the activity has potential to adversely affect the nest. If construction activities cause the nesting bird to vocalize, make defensive flights at intruders, get up from a brooding position, or fly off the nest, then the no-disturbance buffer shall be increased until the agitated behavior ceases. | |
| **Impact 3.3-4: Cause Disturbance to or Loss of Loggerhead Shrike, California Horned Lark, and Other Nesting Birds**<br>Implementation of the proposed project would result in vegetation clearing and construction activities in proximity to suitable nesting habitat for loggerhead shrike, California horned lark, and other nesting birds. These activities could result in disturbance to or loss of individual nests or disruption of nesting attempts by loggerhead shrike, horned lark, and possibly other nesting bird species if they nest in the project site in the future. The disturbance to or loss of loggerhead shrike, California horned lark, and other special-status bird nests would be a potentially significant impact. | PS | **Mitigation Measure 3.3-4: Protect Loggerhead Shrike, California Horned Lark, and Other Nesting Birds**<br>Consistent with the avoidance and minimization measures in the SJMSCP, the City will implement the following measures to reduce impacts on loggerhead shrike, California horned lark, and other nesting birds:<br>a) A qualified biologist shall conduct a preconstruction survey for any project activity that would occur during the nesting bird season (February 1–August 31) and within 100 feet of suitable nesting habitat, including shrubs, riparian vegetation, trees, and barren areas within the CTF. The survey shall be conducted within 14 days before project activity begins.<br>b) If no loggerhead shrike, California horned lark, or other nesting birds are found, no further mitigation is required. If active nests are found, the qualified biologist shall establish a no-disturbance buffer around the nest location. A setback of 100 feet from nesting areas for loggerhead shrike shall be established and maintained during the nesting season for the period encompassing nest building and continuing until fledglings leave nests. This setback applies whenever construction or other ground-disturbing activities must begin during the nesting season in the presence of nests that are known to be occupied. Setbacks shall be marked by brightly colored temporary fencing. For other protected birds, the qualified biologist shall determine the buffer distance based on bird species; listing status; and other factors, including distance from construction activity, type and duration of construction, and whether the nest in within the line of sight of construction activity. The size of the buffer may be adjusted if the qualified biologist and the City, in consultation with CDFW, determine that such an adjustment would not be likely to adversely affect the nest. | LTS |

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| **Impact 3.3-5: Cause Disturbance to or Loss of Riparian Brush Rabbit**<br>Implementation of the proposed project would result in riparian vegetation clearing; construction activities in proximity to occupied riparian brush rabbit habitat, which could result in the disturbance to or loss of individuals or occupied habitat; disruption of foraging attempts; or take of individual riparian brush rabbits. The disturbance to or loss of riparian brush rabbit would be a potentially significant impact. | PS | **Mitigation Measure 3.3-5: Protect Riparian Brush Rabbit**<br>The City will consult with the USFWS under ESA and with CDFW under CESA to obtain the required incidental take authorizations, if needed, and implement the following measures to avoid and minimize impacts on riparian brush rabbit:<br>▸ Levee construction and staging areas will be identified in construction drawings, and exclusion fencing will be installed to delineate their boundaries. Exclusion fencing will be maintained/repaired through the length of construction.<br>▸ Where suitable riparian brush rabbit habitat is adjacent to staging and construction areas, this habitat will be identified as an environmentally sensitive area in construction drawings and will be flagged with exclusion flagging in the field. Construction personnel, vehicles, and equipment must remain within the identified construction/staging area and outside of the environmentally sensitive area.<br>▸ Where construction or staging activities would occur within suitable riparian brush rabbit habitat, vegetation within the habitat will be removed by hand (with hand tools or hand-operated power equipment) at least 2 weeks before construction-related ground disturbance would occur in the habitat area. Vegetation will be cut to ground level and maintained at ground level throughout the construction period to deter use of the area by riparian brush rabbits.<br>▸ Before ground-disturbing activities begin, a silt fence or other suitable temporary barrier that will exclude brush rabbits from the construction area will be installed around the construction/staging area where it borders or is located within suitable habitat. Temporary signage will be placed along the rabbit exclusion fence at 150-foot intervals, warning contractors to stay within the construction area. The temporary rabbit exclusion fence and associated signage will be inspected by a qualified biologist each morning before beginning construction activities and repaired and maintained as necessary. The temporary rabbit exclusion fence and signage will be removed after construction activities are no longer required in the exclusion area.<br>▸ While construction is underway, a biological monitor will conduct daily surveys of the construction area before the start of activities for the day to determine whether riparian brush rabbits are within the construction area. If riparian brush rabbits are located within the construction area, construction activities will not start until the animal has left the construction area on its own or is removed by an approved permitted biologist. | LTS |

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| | | ▶ Trash, including food wrappings, will be removed from the levee construction/staging areas daily to avoid attracting potential predators, such as feral cats, dogs, coyote, or foxes to the area.<br>Additional measures may be developed with USFWS and CDFW during the consultation process. These measures may include, but would not be limited to, compensation for disturbance to or loss of habitat, implementation of a trapping program to remove feral animals and rats from the Mossdale Oxbow Preserve, and coordination to assist with the USFWS captive breeding program. Compensation for disturbance to or loss of habitat could include enhancement of existing habitat and creation of additional habitat, including development and implementation of a riparian vegetation restoration plan after construction along the levee has been completed. | |
| **Impact 3.3-6: Cause Disturbance to and Loss of Waters of the United States and State**<br>Construction of the proposed outfall in the San Joaquin River would result in permanent fill of approximately 0.10 acre of waters of the United States and state. Therefore, implementation of the proposed project would result in a substantial adverse effect on federally protected and state-protected waters. Loss of wetlands and other waters of the United States and state would be a significant impact. | S | **Mitigation Measure 3.3-6: Compensate for Loss of Waters of the United States and State**<br>The City will implement the following measures to compensate for the loss of waters of the United States and state:<br>a) The City submitted the aquatic resources delineation report to USACE, and requested a jurisdictional determination. Based on the jurisdictional determination, the City will confirm the exact acreage of waters of the United States and waters of the state that would be filled as a result of project implementation.<br>b) The City will replace on a "no net loss" basis (minimum 1:1 ratio) (in accordance with USACE and/or Central Valley RWQCB) the acreage and function of all wetlands and other waters that would be removed, lost, or degraded as a result of project implementation. Wetland habitat will be replaced or enhanced at a location acceptable to or approved by USACE and the Central Valley RWQCB, either on-site, by participation in the National Fish and Wildlife Foundation in-lieu fee program, by the purchase of mitigation credits at an approved mitigation bank (e.g., Cosumnes Floodplain Mitigation Bank), or any combination thereof. The acreage and location of mitigation will be determined during the Section 401 and Section 404 permitting processes.<br>c) The City will obtain a USACE Section 404 permit and RWQCB Section 401 water quality certification before any groundbreaking activity within 50 feet of any wetland or water of the United States or state. The City will implement all permit conditions.<br>d) A dewatering and diversion plan for the San Joaquin River will be developed as necessary. No groundbreaking activities will occur until the dewatering and diversion plan has been approved by the resource agencies. | LTS |

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| **Impact 3.3-7: Cause Disturbance to or Loss of Riparian Habitat**<br>Implementation of the proposed project, including construction of the proposed outfall and installation of the new effluent discharge pipe along the San Joaquin River levee, would result in disturbance to or direct removal of riparian vegetation. This impact would be significant. | S | **Mitigation Measure 3.3-7: Minimize and Compensate for the Loss of Riparian Habitat**<br>The City will implement the following measures, which in addition to others, include the incidental take and avoidance measures in the SJMCSP for riparian habitat:<br>▸ Require appropriate erosion control measures (e.g., use hay bales, filter fences, vegetative buffer strips, or other accepted equivalents) to reduce the amount of siltation and contaminated runoff from the project site.<br>▸ Retain emergent (rising out of water) and submergent (covered by water) vegetation.<br>▸ Retain vegetation as practical within the constraints of the proposed development as determined by the SJMSCP Joint Powers Authority with the concurrence of the permitting agencies' representatives on the Technical Advisory Council. Rapidly sprouting plants, such as willows, should be cut off at the ground and root systems left intact, when removal is necessary.<br>▸ The City will submit a notification of lake and streambed alteration to CDFW for work within the bed, bank or channel of the San Joaquin River.<br>▸ The acreage of valley oak woodland and forest habitat removed will be replaced or restored/enhanced at a minimum 1:1 ratio with habitat comprising ecological conditions similar to those provided by the habitat removed from the project site, including similar species composition and diversity and functional organization. Habitat restoration, enhancement, and/or replacement will be at a location and by methods acceptable to SJMSCP staff and/or CDFW. This may include on-site restoration of riparian habitat, purchase of mitigation credits at a CDFW-approved mitigation bank (e.g., Cosumnes Floodplain Mitigation Bank), or a combination of these.<br>▸ Compensatory mitigation requirements in compliance with the SJMSCP will be calculated from the edge of a 100-foot buffer zone to the edge of the riparian vegetation as it extends into the river. | LTS |
| **Impact 3.3-8: Cause Disturbance to or Loss of Terrestrial Wildlife Corridors**<br>Most of the proposed project would be constructed within already developed habitat and therefore would have no impact on wildlife corridors. However, the SJMSCP identifies the San Joaquin River as a wildlife corridor, and project activities within the river and its levee would result in temporary disturbance to this wildlife corridor. Because the proposed outfall would be constructed below the OHWM of the river and within the levee, no permanent barrier to the movement of terrestrial wildlife would occur. The impact on terrestrial wildlife movement would be less than significant. | LTS | No mitigation is required for this impact. | LTS |

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| Aquatic Biological Resources | | | |
| **Impact 3.4-1: Result in Construction-Related Underwater Noise and Vibration Impacts on Fish and Their Prey Organisms**<br>Construction-related underwater noise, vibrations, and disturbance from constructing the CTF outfall has the potential to affect migrations and movements of fish near the outfall site or cause adverse effects on prey resources in the area. Most fish would move past the construction site in a portion of the river channel that is a sufficient distance from the area of disturbance and thus would not experience noise or vibrations at levels that would cause any chronic, adverse effects on fish. Fish that move close enough to the pile driving to experience a startle response from the underwater noise levels would simply move away from the noise, or drift with the currents past the site and away from the disturbance. In addition, all work would be limited to daylight hours during the week, leaving extensive periods of undisrupted passage for migrating fish and resident fish to move past the site daily in the evenings, in between periods of pile driving, and on weekends when no construction would occur. Any small, localized losses of BMI and zooplankton from noise generated by pile driving activities would be minimal and would not have population-levels effects. Therefore, underwater noise and vibrations from construction-related activities would not lead to substantial adverse effects on special-status fishes, resident fishes, or their prey resources and would not interfere substantially with the movement of any native resident or migratory fish species past the construction site. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.4-2: Cause Direct Fish Injury or Mortality during Construction Resulting in Impacts on Fish Populations**<br>Construction of the coffer dam, subsequent dewatering of the area to provide a dry work area, and restoration of natural contours of the river post-construction have the potential to cause direct mortality or injury to special-status fishes or other fish of the lower San Joaquin River. The potential for direct mortality or injury to special-status fishes would be minimized by limiting in-river construction activities to the July 1 to October 31 period and installing a coffer dam to hydraulically isolate the outfall installation from the river. The very limited injury or mortality that could potentially occur to non-special-status fish species would not occur at a level that would cause a substantial reduction in their population. Nevertheless, it is possible that individual special-status fish could become stranded in the coffer dam footprint. The potential for direct mortality or injury to | PS | **Mitigation Measure 3.4-2: Conduct Fish Rescue and Relocation Operation**<br>The City will implement the following measures to avoid, minimize, and mitigate this potentially significant impact on San Joaquin River special-status fishes:<br>▸ A fish rescue operation will be completed as water elevations within the coffer dam reach low levels. Fish rescue will be completed by qualified biologists using dip and seine nets to remove any fish remaining within the coffer dam. All fish rescued from inside the coffer dam will be placed in the San Joaquin River away from construction activities.<br>▸ Once the dewatered area has been deemed free of any entrained fishes, the area will be completely dewatered using the submersible pumps. Depending on the amount of leakage between the sheet piles, the submersible pumps may have to be operated at regular intervals to keep the work area dry. | LTS |

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| special-status fishes stranded within the coffer dam would constitute a substantial adverse effect to the special-status species and thus would be a potentially significant impact. | | | |
| **Impact 3.4-3: Result in Adverse Effects on Aquatic Species Because of Alterations in Aquatic and Riparian Habitat during Construction**<br>Implementation of the proposed project, including construction of the proposed outfall and installation of the new effluent discharge pipe over the San Joaquin River levee, would result in disturbance to or direct removal of a small amount of riparian vegetation and temporary modifications to a small area of aquatic habitat. Such modification of this area of the lower San Joaquin River would not have an appreciable effect on the overall quantity and quality of available habitat for fish, BMI, or plankton communities within the river. Consequently, adverse effects on aquatic species due to alterations in aquatic and riparian habitats of the lower San Joaquin River during construction would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.4-4: Result in CTF Discharge-Related Effects on Seasonal Fully Mixed River Temperatures and Associated Thermal Impacts on Fish, Phytoplankton, Zooplankton, and BMI**<br>CTF discharges at 2.5 and 6.0 mgd ADWF would result in minor increases (i.e., ≤0.6□F and typically ≤0.3□F) in fully mixed San Joaquin River temperatures. The minor river temperature increases that would occur would not be of sufficient magnitude to block or delay fish migrations/movements past the outfall area; cause lethality or chronic, adverse sublethal effects on any species of fish, phytoplankton, zooplankton, or BMI using the river in the vicinity of the proposed outfall; reduce the amount of usable aquatic habitat within the affected environment; or result in adverse changes to designated critical habitat for federal ESA-listed species. Because fully mixed river temperatures with the project would not cause adverse effects on fish, phytoplankton, zooplankton, or BMI at the individual level, no population-level or community level adverse effects would occur. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.4-5: Cause Thermal Impacts on Fish, Phytoplankton, Zooplankton, and BMI Moving Past or through the Thermal Plume near the CTF Outfall**<br>CTF discharges at 2.5 and 6.0 mgd ADWF would result in a thermal plume within the San Joaquin River near the outfall. The thermal plume conditions that would occur throughout the year under various effluent and river temperatures and flow conditions would not block or delay special-status fish migrations past the outfall, | LTS | No mitigation is required for this impact. | LTS |

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| cause lethality to adult, juvenile, or larval life stages of fishes passing through the plume, or cause any chronic, adverse sublethal effects. Because no adverse effects would occur to individual fish, no population-level adverse effects would occur. Similarly, the thermal plumes that would be present in the channel near the outfall would not cause lethality or any chronic, adverse sublethal effects on phytoplankton, zooplankton, or BMIs drifting through the plume. Because no adverse effects would occur at the individual level for these aquatic organisms, which have similar or greater thermal tolerances to that of fish, no population or community-level adverse effects would occur due to the thermal plumes. Finally, the thermal plumes would not cause increased predation on emigrating special-status fishes or reduce the quantity or value of usable habitat, including designated critical habitat for ESA-listed fishes. This impact would be less than significant. | | | |
| **Impact 3.4-6: Result in Operations-Related Effects on River Flow and Physical Habitat and Associated Impacts on Fish and Other Aquatic Organisms**<br>The proposed project would not reduce or substantially change river flow or wetted physical habitat within the San Joaquin River. The CTF outfall structure constructed within the river channel would not be expected to create sizable areas of hydraulic velocity breaks where predatory fishes such as striped bass would hold and prey upon emigrating special-status fishes as they moved past the outfall. Overall project effects on river flow and physical habitat would be minor and would have no adverse effects on fish or other aquatic organisms. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.4-7: Affect Salmonid Movements or Behavior within the San Joaquin River due to Copper Concentrations in the Effluent Discharge**<br>The CTF discharges would have minor effects on copper concentrations in the San Joaquin River, and river concentrations would always remain below applicable California Toxics Rule criteria and Basin Plan objectives for copper. The organic carbon levels in both the effluent and the river would eliminate any possibility for river copper concentrations to cause inhibition of olfactory function in salmonids migrating through the lower San Joaquin River. Therefore, this is impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |

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| Cultural, Tribal Cultural, and Paleontological Resources | | | |
| Impact 3.5-1: Cause a Substantial Adverse Change in the Significance of Historical Resources<br>No historic resources pursuant to Section 15064.5 of the State CEQA Guidelines were identified on the project site. There would be no impact. | NI | No mitigation is required for this impact. | NI |
| Impact 3.5-2: Cause a Substantial Adverse Change in the Significance of Archaeological Resources<br>Although no archaeological resources have been identified on the project site, project-related ground-disturbing activities could result in the discovery or damage of previously undiscovered archaeological resources as defined in State CEQA Guidelines Section 15064.5. This would be a potentially significant impact. | PS | Mitigation Measure 3.5-2: Implement Inadvertent Discovery Measures for the Protection of Archaeological Resources<br>If any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil ("midden"), that could conceal cultural deposits are inadvertently discovered during project-related construction activities, all ground-disturbances within a minimum of 50 feet of the find shall be halted until a qualified professional archaeologist can evaluate the discovery. The archaeologist shall examine the resources, assess their significance, and recommend appropriate procedures to the lead agency to either further investigate or mitigate adverse impacts (e.g., adverse effect on a significant historical resource). If the qualified archaeologist determines the archaeological material to be Native American in nature, the City shall contact the appropriate California Native American tribe for their input on the preferred treatment of the find. If the find is determined to be a unique archaeological resource and it cannot be avoided, then appropriate procedures to protect the integrity of the resource shall be applied (e.g., preservation in place, data recovery program pursuant to PRC Section 21083.2[i]). During evaluation or mitigative treatment, ground-disturbance and construction work may continue on other parts of the project site. | LTS |
| Impact 3.5-3: Cause a Substantial Adverse Change in the Significance of a Tribal Cultural Resource<br>No TCRs have been documented in the project site, however, project-related ground-disturbing activities could result in the discovery or damage of previously undiscovered TCRs. Newly discovered prehistoric, ethnohistoric, or historic-era archaeological sites could be recognized as TCRs and could be adversely affected during project construction. This impact would be potentially significant. | PS | Mitigation Measure 3.5-3: Implement Inadvertent Discovery Measures for the Protection of Tribal Cultural Resources<br>Implement Mitigation Measure 3.5-2. | LTS |
| Impact 3.5-4: Disturb Human Remains<br>Although there is a low potential for human remains to be discovered during ground-disturbance for the proposed project, construction activities could inadvertently uncover or disturb human remains, including those interred outside of formal cemeteries. This would be a potentially significant impact. | PS | Mitigation Measure 3.5-4: Implement Inadvertent Discovery Measures for the Protection of Human Remains<br>If human remains are discovered during project-related ground-disturbance, all work within a minimum of 50 feet of the discovery site shall halt immediately. The | LTS |

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| | | lead agency shall notify the County Coroner, as stipulated in Section 7050.5 of the California Health and Safety Code. The Coroner shall determine whether the remains are Native American and, if so, contact the NAHC by telephone within 24 hours. The NAHC shall follow the stipulations in Section 5097.98 of the California Public Resources Code, including determination of a most likely descendant. If the NAHC is unable to identify a descendant, the descendant is unable to make a recommendation, or the landowner rejects the recommendation, the NAHC shall mediate any dispute between the parties. Where such mediation fails to provide measures acceptable to the landowner, the landowner shall reinter the human remains and associated funerary items with appropriate dignity on the property, in a location not subject to further subsurface disturbance. | |
| **Impact 3.5-5: Disturb Paleontological Resources**<br>The project site is underlain by geologically immature flood basin (Qb) and river (Qr) deposits which are considered to have a low paleontological potential. Additionally, the low sensitivity Holocene deposits within the project site are known to extend to considerable depths, up to 20,000 feet, so the proposed project is not likely to disturb any underlying geologic units. This would be a less-than-significant impact. | LTS | No mitigation is required for this impact. | LTS |
| **Energy** | | | |
| **Impact 3.6-1: Result in the Wasteful, Inefficient, or Unnecessary Consumption of Energy during Project Construction or Operation**<br>Implementing the proposed project would not introduce substantial additional operational energy consumption from electricity, natural gas, gasoline, or diesel fuel consumption. It would result in the consumption of construction-related gasoline and diesel fuel; however, this consumption would facilitate the proposed project's objectives to provide for effluent discharge to the San Joaquin River to support planned growth in the City, provide efficient and cost-effective wastewater services to the City, and maximize the use of recycled water in the City. Therefore, construction energy consumption would not be wasteful, inefficient, or unnecessary. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|
| NI = No impact LTS = Less than significant PS = Potentially significant S = Significant SU = Significant and unavoidable | | | |
| **Impact 3.6-2: Conflict with or Obstruct a State or Local Plan for Renewable Energy or Energy Efficiency**<br>Implementing the proposed project would not generate operational energy demand beyond baseline conditions; it would result in energy consumption during project construction from the combustion of gasoline and diesel fuel. This one-time energy expenditure would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, which generally focus on reducing operational energy demand, not construction-related energy consumption. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| Greenhouse Gas Emissions and Climate Change | | | |
| **Impact 3.7-1: Potential to Generate GHG Emissions During Construction and Operation of the Proposed Project**<br>Amortized project-generated construction emissions would total 49 MTCO2e, and project operation would result in 8,453 MTCO2e per year, resulting in a combined total of 8,502 MTCO2 per year. These levels of emissions would not exceed the applicable stationary bright-line threshold of 10,000 MTCO2e per year. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| Hazards and Hazardous Materials | | | |
| **Impact 3.8-1: Create a Significant Health Hazard from the Routine Transport, Use, or Disposal of Hazardous Materials, Including Reasonably Foreseeable Upset or Accidents**<br>Construction activities could potentially result in small fuel or oil spills during equipment refueling or routine maintenance, as well as exposure to previously unknown subsurface contaminants during trenching. Routine transport to, and use of chemicals, including sodium bisulfite, at the CTF to support proposed project operations also could potentially result in exposure to or release of hazardous chemicals. However, to comply with General Plan policies and statewide regulations and minimize the potential to create health hazards, the required spill prevention, containment, and treatment plans would be implemented during construction and site specific plans for Hazardous Substance Spill Prevention and Response, Emergency Action, Fire Prevention, Chemical Management, Hazardous Material Management, and Hazardous Communication would be implemented to support ongoing operations and maintenance. Therefore, construction and operation of the proposed project would not create a significant health hazard from the routine, transport, use, or disposal of hazardous materials or accidental | PS | **Mitigation Measure 3.8-1: Implement Mitigation Measure 4.14.-1, "Existing Hazardous Materials/Waste Sites," Incorporated by Reference into the 2013 CTF IS/MND**<br>Prior to the development of proposed pipelines/facilities, the City shall have performed a records search of government-recorded hazardous waste sites to identify any proposed pipelines/facilities that bisect recorded hazardous waste sites. In cases where proposed pipelines/facilities intersect recorded hazardous waste sites, or where any soil discoloration, vapors, or other signs of potential contamination exist at the construction sites for these facilities, a qualified consultant shall monitor excavations with an organic vapor analyzer. Soils that exhibit elevated readings, odor, or visual evidence of contamination shall be sampled for laboratory analysis. If the samples are found to be contaminated above Department of Toxic Substances Control (DTSC) acceptable levels, the subject soils at the construction sites for the proposed pipelines/facilities shall be excavated, segregated, treated (if required), and disposed of in accordance with DTSC requirements. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|
| NI = No impact LTS = Less than significant PS = Potentially significant S = Significant SU = Significant and unavoidable | | | |
| release into the environment. However, because construction activities could encounter undocumented hazardous wastes during trenching activities that could result in a hazard to construction workers, adjacent land uses, and the environment, this impact would be potentially significant. | | | |
| **Impact 3.8-2: Impair Implementation of or Physically Interfere with an Adopted Emergency Response Plan or Emergency Evacuation Plan**<br>Construction of the proposed project would result in construction activities within road rights-of-way, which could temporarily limit emergency access or evacuation along these roadways. The proposed underground pipelines, outfall structure, and modifications at the CTF would not represent a physical barrier to the flow of traffic in the City and project operations would not generate traffic in sufficient quantities to result in traffic congestion during an emergency. Because the proposed project would include developing and implementing a traffic control plan per requirements of the City's Encroachment Permit process, potential interference with emergency access or evacuation along roadways in the project site during construction activities would be avoided. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| Hydrology and Water Quality | | | |
| **Impact 3.9-1: Result in Impacts on Water Quality during Project Construction**<br>Project construction activities would have the potential to result in a temporary increase in San Joaquin River total suspended solids (TSS) and turbidity near the construction site and the release of contaminants into the river. Implementation of various permit requirements, including SWRCB Construction General Permit requirements and CWA Section 401 Water Quality Certification requirements, which would be required for project construction, would avoid and minimize potential adverse construction-related effects on surface water quality. Therefore, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-2: Result in Impacts on Flood Flows and Associated Erosion during Project Construction**<br>The placement of the coffer dam for construction of the effluent outfall structure would temporarily reduce San Joaquin River channel capacity. Because the coffer dam would be in place during the summer period of lowest river flows, when large precipitation events do not occur, there would be no effect on flood flows or flood-flow conveyance, and thus no increased channel erosion. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|
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| **Impact 3.9-3: Result in Impacts on Groundwater during Project Operation**<br>With the proposed project, CTF effluent would no longer be discharged to existing land application areas. Because discharge is not a significant source of groundwater recharge for the underlying basin, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-4: Result in Hydraulic Impacts That Would Cause Substantial Erosion or Impede or Redirect Flood Flows during Project Operation**<br>The project would install the new outfall structure within the existing profile of the San Joaquin River channel, would occupy less than 1 percent of the cross-sectional area at federal project design flows, and would consist of concrete embedded into the levee and protected with erosion control material. Therefore, the project would not result in substantial erosion or impede flood flows through the channel post-construction, and the hydraulic impacts of the proposed project would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-5: Result in Impacts on Water Quality during Project Operation: Various Contaminants**<br>The proposed project would result in the discharge of metals, mercury, and potentially other contaminants, such as pesticides and semivolatile organic compounds, to the San Joaquin River. Concentrations of these contaminants in the undiluted CTF discharge would be lower than applicable federal water quality criteria and state water quality objectives, except for barium, which would exceed the Basin Plan objective. However, because barium concentrations would not exceed the Basin Plan objective upon mixing with San Joaquin River water, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-6: Result in Impacts on Water Quality during Project Operation: EC and TDS**<br>The proposed project would result in the discharge of salinity-related constituents that would result in measurable effects on EC and TDS levels in the San Joaquin River near the proposed outfall location. However, the project would not cause EC levels to exceed the Bay-Delta Plan objective for the southern Delta or cause TDS concentrations to exceed the drinking water MCL. Therefore, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|
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| **Impact 3.9-7: Result in Impacts on Water Quality during Project Operation: Trihalomethane Compounds**<br>The proposed project would result in the discharge of bromoform, chlorodibromomethane (CDBM), chloroform, and dichlorobromomethane (DCBM) to the San Joaquin River. There are no regulatory criteria for chloroform. Concentrations of bromoform, CDBM, and DCBM in the undiluted CTF discharge would be greater than applicable CTR criteria. However, long-term average concentrations in the San Joaquin River would be less than CTR criteria in areas that could potentially be used for municipal supply, which is the beneficial use of concern for these compounds. Therefore, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-8: Impacts on Water Quality from Project Operation: pH**<br>The proposed project would result in discharge to the San Joaquin River of effluent with a pH within the range required by the Basin Plan and thus would not cause the river pH to fall outside of the range required by the Basin Plan. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-9: Result in Impacts on Water Quality during Project Operation: Turbidity**<br>The proposed project would result in discharge to the San Joaquin River of effluent with a turbidity less than the turbidity of the river. Thus, the project would not cause exceedance of the Basin Plan turbidity objective or degradation of water quality for turbidity. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-10: Result in Impacts on Water Quality during Project Operation: Ammonia, Nitrate plus Nitrite, Phosphorus, and Nutrient Biostimulation**<br>The proposed project would result in the discharge of ammonia, nitrate, nitrite, and phosphorus to the San Joaquin River. River concentrations of ammonia with the project would be similar to existing conditions, and the discharge would not cause exceedance of EPA's ammonia criteria for the protection of freshwater aquatic life. River concentrations of nitrite also would be similar to existing conditions and would not exceed the drinking water MCL. River nitrate concentrations would be higher with the proposed project but would not exceed the drinking MCL. River phosphorus concentrations also would be higher with the project. The small increases in nitrate and phosphorus concentrations would not contribute to adverse biostimulatory effects in the Delta. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|
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| **Impact 3.9-11: Result in Impacts on Water Quality during Project Operation: Dissolved Oxygen**<br>The proposed project would result in the discharge of oxygen-demanding substances—measured as ammonia and biological oxygen demand (BOD)—to the San Joaquin River. River concentrations of ammonia and BOD with the project would remain similar to existing conditions; thus, the proposed discharge would not decrease dissolved oxygen concentrations in the river below existing conditions or to less than the Basin Plan water quality objective. Therefore, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-12: Result in Impacts on Water Quality during Project Operation: Temperature**<br>The proposed project would result in the discharge of effluent that is typically warmer than ambient San Joaquin River temperatures. The project has been designed to not cause exceedance of the Thermal Plan objectives for temperature. Further, based on analysis in Section 3.4, "Aquatic Biological Resources," both the 2.5 and 6.0 mgd ADWF discharge temperature conditions would not cause lethality or any adverse sublethal effects on fishes or their prey organisms. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.9-13: Result in Impacts on Water Quality during Project Operation: Endocrine-Disrupting Compounds and Constituents of Emerging Concern**<br>The CTF effluent may contain chemical compounds that are classified as unregulated constituents of emerging concern (CECs), including those specific compounds that are considered to be endocrine-disrupting compounds (EDCs). There are no adopted regulatory criteria against which to evaluate CEC concentrations, and effects of CECs are not well understood and are the subject of ongoing research. Therefore, a significance conclusion on the environmental impacts of CEC discharges under the proposed project would be highly speculative and thus cannot be reasonable made based on available information. | LTS | No mitigation is required for this impact. | LTS |
| Noise and Vibration | | | |
| **Impact 3.10-1: Generate Excessive Noise Levels During Construction**<br>Proposed project construction would result in elevated noise levels at the single-family residences along Inland Passage Way and could result in the potential for annoyance. However, noise generated by construction activity would be temporary, intermittent, and periodic, and would occur during daytime hours when people are less sensitive to noise, pursuant to Section 8.20.110 of the Municipal Code. Therefore, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |

| Impacts | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|
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| **Impact 3.10-2: Generate Excessive Operational Noise Levels**<br>Operation of the proposed project would not introduce new long-term stationary noise sources located close to noise-sensitive receptors, increase traffic noise, or expose any noise-sensitive receptors to noise levels that exceed any noise standards. Therefore, this impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |
| **Impact 3.10-3: Generate Excessive Ground-borne Vibration Levels During Construction**<br>Vibration generated by pile driving and other construction activities would not have the potential to cause structural damage or human annoyance. This impact would be less than significant. | LTS | No mitigation is required for this impact. | LTS |

# 1 INTRODUCTION

This draft environmental impact report (Draft EIR) evaluates the environmental impacts of the proposed Lathrop Consolidated Treatment Facility (CTF) Surface Water Discharge Project (proposed project). It has been prepared under the direction of the City of Lathrop (City) in accordance with the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21000 et seq.) and the State CEQA Guidelines (Title 14 California Code of Regulations [CCR], Section 15000 et seq.). This chapter of the Draft EIR provides information on the following:

- project requiring environmental analysis (synopsis),
- purpose and intended uses of the Draft EIR,
- tiering from previous environmental analyses,
- scope of this Draft EIR,
- agency roles and responsibilities,
- public review process,
- organization of this Draft EIR, and
- standard terminology used in this Draft EIR.

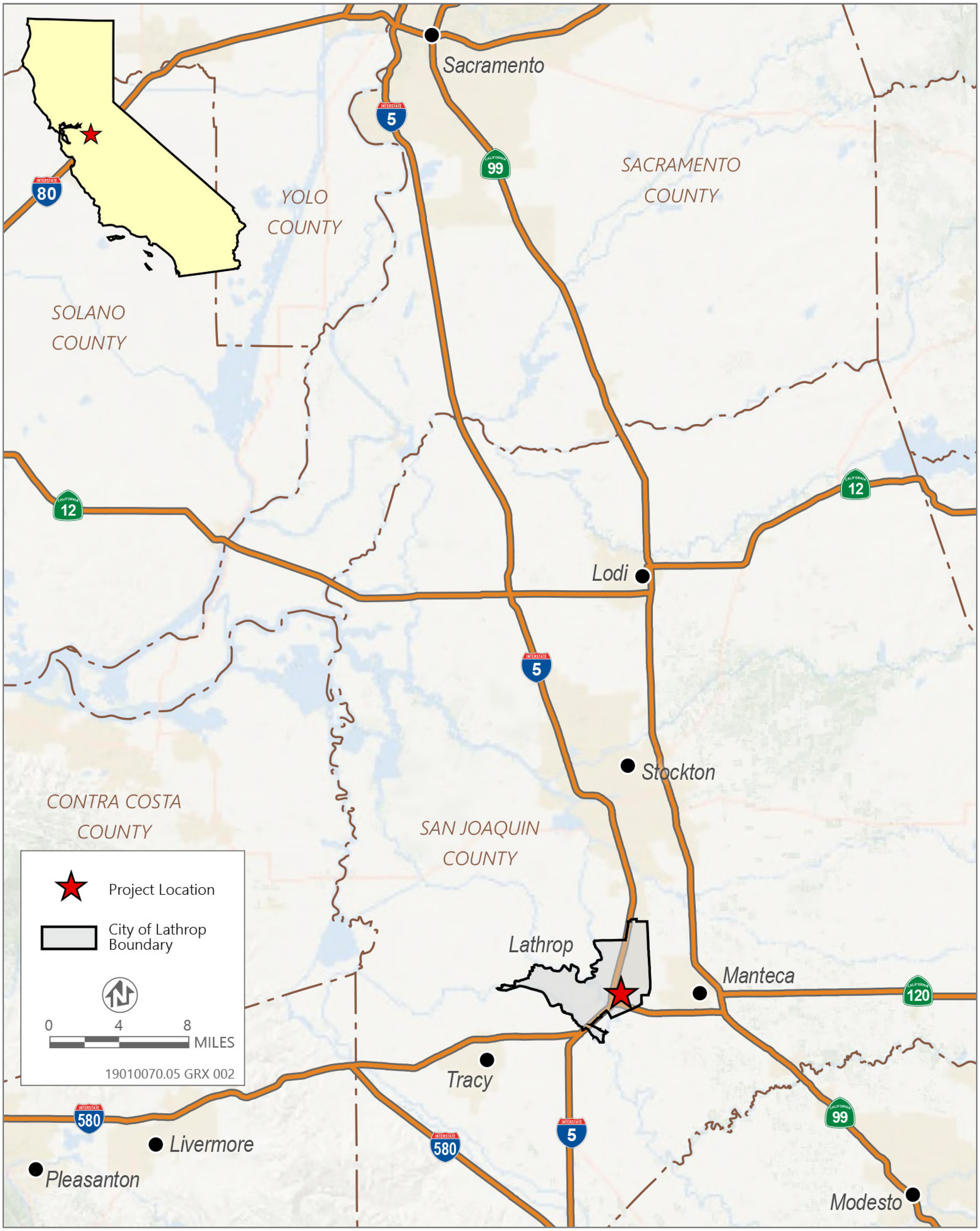
## 1.1 PROJECT REQUIRING ENVIRONMENTAL ANALYSIS

Lathrop is located in San Joaquin County, approximately 10 miles south of the City of Stockton and directly west of the City of Manteca. The City lies east of the Coast Ranges, which separate California's Central Valley from the San Francisco Bay Area. Interstate 5 (I-5), a major north-south interstate corridor, bisects the City. State Route 120 runs east-west through the southeasternmost part of the City, connecting to I-205, which connects I-580 to I-5 (Figure 1-1).

The City is proposing to establish a direct discharge of highly treated wastewater from its CTF to the San Joaquin River to facilitate development consistent with the City General Plan. Currently, recycled water generated at the CTF is stored in ponds and used for urban and agricultural irrigation. The City plans to continue to use CTF recycled water for landscape irrigation as the City is developed; however, some areas used for recycled water storage and agricultural land application are designated under the general plan for urban uses. With implementation of the proposed project, the majority of CTF effluent would be discharged to the San Joaquin River during winter, when irrigation demands are low and river flow is relatively high, and less would be discharged during the irrigation season, when reuse of CTF recycled water would be maximized for landscape irrigation. This approach would allow land designated for urban uses in the general plan to be developed in accordance with the plan.

The CTF treats wastewater to a very high level. The effluent meets Title 22 of the CCR, which governs the use of recycled water. Title 22 provides standards for treatment quality and specifies use restrictions. The proposed project would involve modifications to the CTF to remove chlorine from disinfected effluent to provide for discharge of dechlorinated effluent to the San Joaquin River, as well as installation of effluent pipelines within City rights-of-way and a new side-bank outfall along the San Joaquin River sized to accommodate up to 6 million gallons per day (mgd) average dry weather flow (ADWF).[1] Construction of the proposed project is anticipated to begin in spring 2021 and be completed within approximately 18 months.

1 The project would accommodate 5.2 mgd of discharge at buildout of the Lathrop General Plan. The pipeline would be sized to accommodate up to 6 mgd because of overall trends in development and in light of projects currently proposed in the City that would increase City buildout. The difference in size between a pipeline that can accommodate 5.2 mgd and 6 mgd is small (less than a few inches in diameter). However, it is prudent to appropriately size the pipeline now to avoid the cost and environmental disruption if a larger size is needed in the future.




Source: Prepared by Ascent Environmental in 2020

**Figure 1-1 Proposed Project Location**

The current design capacity of the CTF is 2.5 mgd ADWF. CTF flows at buildout, based on the current general plan and the City's current wastewater and recycled water master plans (EKI 2019a, 2019b) are projected to be 5.2 mgd ADWF.

It is noted that before approval of the City's current wastewater and recycled water master plans, the City approved expansion of the CTF and completed project-level CEQA documentation for expansion up to 6.0 mgd ADWF and program-level CEQA documentation for expansion to a total capacity of up to 9.1 mgd ADWF in the adopted *City of Lathrop Consolidated Treatment Facility Initial Study/Mitigated Negative Declaration* (2013 CTF IS/MND) (City of Lathrop 2013).

# 1.2 PURPOSE AND INTENDED USES OF THIS DRAFT EIR

According to CEQA, preparation of an EIR is required whenever it can be fairly argued, based on substantial evidence, that implementing a proposed project may result in a significant environmental impact. An EIR is an informational document used to inform public agency decision makers and the general public of the significant environmental impacts of a project, identify possible ways to minimize the significant impacts, and describe reasonable alternatives to the project that could feasibly attain most of the basic objectives of the project while substantially lessening or avoiding any of the significant environmental impacts. Public agencies are required to consider the information presented in the EIR when determining whether to approve a project. This Draft EIR has been prepared to meet the requirements of a project EIR as defined by Section 15161 of the State CEQA Guidelines. A project EIR focuses on the changes in the physical environment that would result from the implementation of a project, including its planning, construction, and operation. The City's intention in preparing a project EIR is that no further environmental analysis would be required for additional regulatory approvals following approval of the proposed project, absent conditions requiring a subsequent EIR, a supplement to the EIR, or an addendum. (See State CEQA Guidelines Sections 15162–15164.)

# 1.3 TIERING FROM THE CITY OF LATHROP CONSOLIDATED TREATMENT FACILITY INITIAL STUDY/MITIGATED NEGATIVE DECLARATION AND OTHER EIRS

This EIR addresses the Lathrop CTF Surface Water Discharge Project. It is tiered from, and incorporates by reference, the 2013 CTF IS/MND (adopted in June 2013, State Clearinghouse [SCH] No. 2013042011), consistent with Section 15152 of the State CEQA Guidelines and PRC Section 21094. As previously explained, the 2013 CTF IS/MND provides project-level CEQA authorization for expansion of the CTF treatment capacity from 3.0 mgd to 6.0 mgd and program-level CEQA authorization for an additional 3.1 mgd of treatment capacity, for a total capacity of 9.1 mgd at the CTF. Specifically, this EIR incorporates by reference the project-level environmental analysis of the CTF expansion, and applicable mitigation measures identified in the 2013 CTF IS/MND. The 2013 CTF IS/MND considered all impacts related to the construction and operation of the expanded CTF using land disposal, but it did not evaluate impacts associated with modification of the CTF to provide dechlorination of treated effluent and discharge of that effluent to the San Joaquin River. The impacts of constructing and operating the proposed dechlorination system, effluent pipeline, and outfall are the focus of this EIR.

The 2013 CTF IS/MND found that implementation of the CTF expansion would have no impact on recreation or forest resources and a less-than-significant impact on mineral resources and public services. Further, implementation of mitigation measures would result in a less-than-significant impact on the following environmental issue areas:

- aesthetics
- agricultural resources
- air quality
- biological resources
- cultural resources
- geology and soils
- greenhouse gas emissions
- hazards and hazardous materials
- hydrology and water quality
- land use and planning
- noise
- population and housing
- transportation/traffic
- utilities and service systems

It was also determined in the 2013 CTF IS/MND that implementation of the CTF expansion would contribute to four project-level significant and unavoidable impacts that were adequately analyzed in other previous environmental documents incorporated by reference into the 2013 CTF IS/MND. The following four significant and unavoidable impacts were adequately analyzed in the *Lathrop Water, Wastewater, and Recycled Water Master Plan Environmental Impact Report* (certified in July 2001, SCH No. 1998082050) and the *City of Manteca Water Quality Control Facility and Collection Systems Master Plans Update Project Environmental Impact Report* (certified in February 2008, SCH No. 2006052164):

- conversion of farmland
- cumulative aesthetic and light and glare impact
- short-term air quality impacts
- long-term odor impacts

# 1.4 SCOPE OF THIS DRAFT EIR

Under the CEQA statute and the State CEQA Guidelines, a lead agency may limit an EIR's discussion of environmental effects when such effects are not considered potentially significant (PRC Section 21002.1[e]; State CEQA Guidelines Sections 15128, 15143). Moreover, if the environmental impacts of a project have already been addressed in a prior certified EIR or approved MND, those impacts need not be addressed in subsequent environmental review associated with a project unless new or more severe significant impacts would result.

In the case of the proposed project, the only differences that could result in new significant effects are those associated with the dechlorination process and discharge of treated effluent to the San Joaquin River, including construction of conveyance pipelines and the river outfall. No new impacts associated with the expansion of the CTF, compared to what was considered in the 2013 CTF IS/MND, would occur because there have been no changes in that approved project.

Information used to determine which impacts would be potentially significant was derived from review of the proposed project; review of applicable planning documents and CEQA documentation; fieldwork; feedback from public and agency consultation; comments received during a public scoping meeting held on December 4, 2019; and comments received on the notice of preparation (NOP) (see Appendix A of this Draft EIR). The issue areas for which effects were determined not to be significant, and thus do not warrant detailed review in this EIR, are described in Section 3.1.1, "Effects Found Not to Be Significant." These issue areas are aesthetics, agriculture and forestry resources, geology and soils, land use, mineral resources, population and housing, public services, recreation, transportation, and wildfire.

The NOP was distributed on November 18, 2019, to responsible agencies, interested parties, and organizations, as well as private organizations and individuals that may have an interest in the proposed project. The purpose of the NOP and the scoping meeting was to provide notification that an EIR for the proposed project was being prepared and to solicit input on the scope and content of the environmental document. Further information on the NOP and scoping process is provided below in Section 1.6, "Public Review Process." As a result of the review of existing information and the scoping process, it was determined that each of the following eight environmental issue areas listed below should be evaluated fully in this Draft EIR, as well as other CEQA-mandated issues (e.g., cumulative impacts, growth-inducing impacts, significant and unavoidable impacts, alternatives):

- air quality;
- biological resources;
- cultural, tribal cultural, and paleontological resources;
- energy;
- greenhouse gas emissions and climate change;
- hazards and hazardous materials;
- hydrology and water quality; and
- noise and vibration.

# 1.5 AGENCY ROLES AND RESPONSIBILITIES

## 1.5.1 Lead Agency

The City of Lathrop is the lead agency responsible for approving and carrying out the proposed project and for ensuring that the requirements of CEQA have been met. After the EIR public review process is complete, the Lathrop City Council will determine whether to certify the EIR (see State CEQA Guidelines Section 15090) and approve the proposed project.

Approval from various City of Lathrop departments would also be required to complete construction of the proposed project. Where City approval may constitute a discretionary decision, such as potential approvals related to street abandonments or utility connections, the City would use the EIR for the proposed project to support these decisions.

## 1.5.2 Trustee and Responsible Agencies

A trustee agency is a state agency that has jurisdiction by law over natural resources that are held in trust for the people of the State of California. The trustee agencies that have jurisdiction over resources potentially affected by the proposed project are the California Department of Fish and Wildlife (CDFW) and California State Lands Commission (CSLC).

Responsible agencies are public agencies, other than the lead agency, that have discretionary-approval responsibility for reviewing, carrying out, or approving elements of a project. Responsible agencies should participate in the lead agency's CEQA process, review the lead agency's CEQA document, and use the document when making a decision on project elements. The following sections identify agencies that may have responsibility for, or jurisdiction over, implementation of elements of the proposed project:

### STATE AGENCIES

- California Department of Transportation (Caltrans)
- California State Water Resources Control Board (SWRCB)
- CDFW
- California State Lands Commission (CSLC)
- Central Valley Flood Protection Board (CVFPB)
- Central Valley Regional Water Quality Control Board (Central Valley RWQCB)
- Delta Stewardship Council (DSC)

### REGIONAL AND LOCAL AGENCIES

- Reclamation District 17 (RD 17)
- San Joaquin Valley Air Pollution Control District (SJVAPCD)

## 1.5.3 Federal Agencies with Discretionary-Approval Responsibility

In addition, the following federal agencies may use this EIR for consideration of permits and approvals:

- National Marine Fisheries Service (NMFS)
- U.S. Army Corps of Engineers (USACE)
- U.S. Fish and Wildlife Service (USFWS)

## 1.5.4 Required Permits and Approvals

The following sections identify permits and other approval actions likely to be required before implementation of individual elements of the proposed project.

### FEDERAL ACTIONS/PERMITS

- NMFS: Endangered Species Act (ESA) Section 7 consultation for authorization of incidental take of a listed species; consultation in compliance with the Magnuson-Stevens Fisheries Conservation Management Act Section 305(b) for effects on essential fish habitat
- USACE: Clean Water Act Section 404 permit for discharge of fill to waters of the United States; Rivers and Harbors Act Section 10 permit for construction in navigable waterways; and Rivers and Harbors Act Section 14 (33 U.S. Code Section 408) authorization or categorical permission for alteration of a federal project levee
- USFWS: ESA Section 7 consultation for authorization of incidental take of a listed species

### STATE ACTIONS/PERMITS

- Caltrans: Encroachment permit for placement of encroachments within, under, or over state highway rights-of-way
- CDFW: Section 1602 Streambed Alteration Agreement; California Endangered Species Act incidental take permit authorizations
- CSLC: General Lease for pipeline right-of-way
- DSC: Certification of consistency with the Delta Plan with detailed findings per Water Code Section 85225
- SWRCB: Potential approval of Clean Water State Revolving Fund loan

### REGIONAL AND LOCAL ACTIONS/PERMITS

- CVFPB: Encroachment permit for work in the floodway
- RD 17: District Permit Agreement for construction and maintenance of facilities affecting the RD 17 levee system
- Central Valley RWQCB: Clean Water Act Section 401 water quality certification; and Clean Water Act Section 402 National Pollutant Discharge Elimination System permit for a surface water discharge
- SJVAPCD: Authority to Construct/Permit to Operate

# 1.6 PUBLIC REVIEW PROCESS

As identified above in Section 1.4, "Scope of This Draft EIR," in accordance with CEQA regulations, an NOP was distributed on November 18, 2019, to responsible agencies, interested parties and organizations, and private organizations and individuals that could have interest in the proposed project. The City held a public scoping meeting on December 4, 2019, to inform interested parties about the proposed project and to provide agencies and the public with an opportunity to provide comments on the scope and content of the EIR. The NOP was available online and in person at the Stockton-San Joaquin County Public Library–Lathrop Branch Library, Lathrop City Hall, and online at: https://www.ci.lathrop.ca.us/com-dev/page/public-review-documents. The NOP and responses to the NOP are included in Appendix A of this Draft EIR.

This Draft EIR is being circulated for public review and comment for a period of 45 days beginning October 21, 2020, and ending December 4, 2020 at 4:00 p.m. During this period, comments from the general public, as well as from organizations and agencies, on environmental issues may be submitted in writing to Michael King, Director of Public Works for the City of Lathrop, via direct mail or email at the following address:

Michael King, P.E.
Director of Public Works
390 Towne Centre Drive, Lathrop, CA 95330
Email: mking@ci.lathrop.ca.us.

A public meeting for the Draft EIR will also be hosted online via the WebEx link below on Tuesday, November 17, 2020, from 5:30 p.m. to 6:30 p.m.

WebEx: https://cityoflathrop.webex.com/cityoflathrop/onstage/g.php?MTID=eef92a7c4b6d9a5281883a329f2958847
Event number (access code): 146 015 4043; Event password: SScZVJkA364.

Upon completion of the public review and comment period, a Final EIR will be prepared that will include both written and oral comments on the Draft EIR received during the public review period, responses to those comments, and any revisions to the Draft EIR made in response to public and agency comments. The Draft EIR and Final EIR together make up the EIR for the proposed project.

Before adopting the proposed project, the lead agency, is required to certify that the EIR has been completed in compliance with CEQA, that the decision-making body reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of the lead agency.

# 1.7 DRAFT EIR ORGANIZATION

This Draft EIR is organized into chapters, as identified and briefly described below. Chapters are further divided into sections (e.g., Chapter 3, “Environmental Impacts and Mitigation Measures,” and Section 3.5, “Energy”):

The “Executive Summary”: This chapter introduces the proposed project; provides a summary of the environmental review process, effects found not to be significant, and key environmental issues; and lists significant impacts and mitigation measures to reduce significant impacts to less-than-significant levels.

Chapter 1, “Introduction”: This chapter describes the legal authority for and purpose of the document, the scope of this Draft EIR, the lead and responsible agencies, and the public review process.

Chapter 2, “Project Description”: This chapter describes the location, background, and goals and objectives for the proposed project and describes the project elements in detail.

Chapter 3, “Environmental Impacts and Mitigation Measures”: The sections in this chapter evaluate the environmental impacts expected under the proposed project, arranged by subject area (e.g., air quality, hydrology and water quality). In each section of Chapter 3, the regulatory background, existing conditions, analysis methodology, and thresholds of significance are described. The anticipated changes to the existing conditions after development of the proposed project are then evaluated for each subject area. For any significant or potentially significant impact that would result from project implementation, mitigation measures are presented, and the level of impact significance after mitigation is identified. Environmental impacts are numbered sequentially within each section (e.g., Impact 3.2-1, Impact 3.2-2, etc.). Any required mitigation measures are numbered to correspond to the impact numbering; therefore, the mitigation measure for Impact 3.2-2 would be Mitigation Measure 3.2-2.

Chapter 4, “Cumulative Impacts”: This chapter provides information required by CEQA regarding cumulative impacts that would result from implementation of the proposed project together with other past, present, and probable future projects.

Chapter 5, “Alternatives”: This chapter evaluates alternatives to the proposed project, including alternatives considered but eliminated from further consideration, the No-Project Alternative, and three action alternatives. The environmentally superior alternative is identified.

Chapter 6, “Other CEQA Sections”: This chapter evaluates growth-inducing impacts and irreversible and irretrievable commitment of resources, and discloses any significant and unavoidable adverse impacts.

Chapter 7, “References”: This chapter identifies the organizations and persons consulted during preparation of this Draft EIR and the documents and individuals used as sources for the analysis.

Chapter 8, “Report Preparers”: This chapter identifies the preparers of the document.

# 1.8 STANDARD TERMINOLOGY

This Draft EIR uses the following standard terminology:

“No impact” means no change from existing conditions (no mitigation is needed).

“Less-than-significant impact” means no substantial adverse change in the physical environment (no mitigation is needed).

“Potentially significant impact” means a possible substantial adverse change in the physical environment (mitigation is recommended because potentially significant impacts are treated the same as significant impacts).

“Significant impact” means a substantial adverse change in the physical environment (mitigation is recommended).

“Significant and unavoidable impact” means a substantial adverse change in the physical environment that cannot be avoided, even with the implementation of all feasible mitigation.

# 2 PROJECT DESCRIPTION

## 2.1 PROJECT BACKGROUND AND NEED

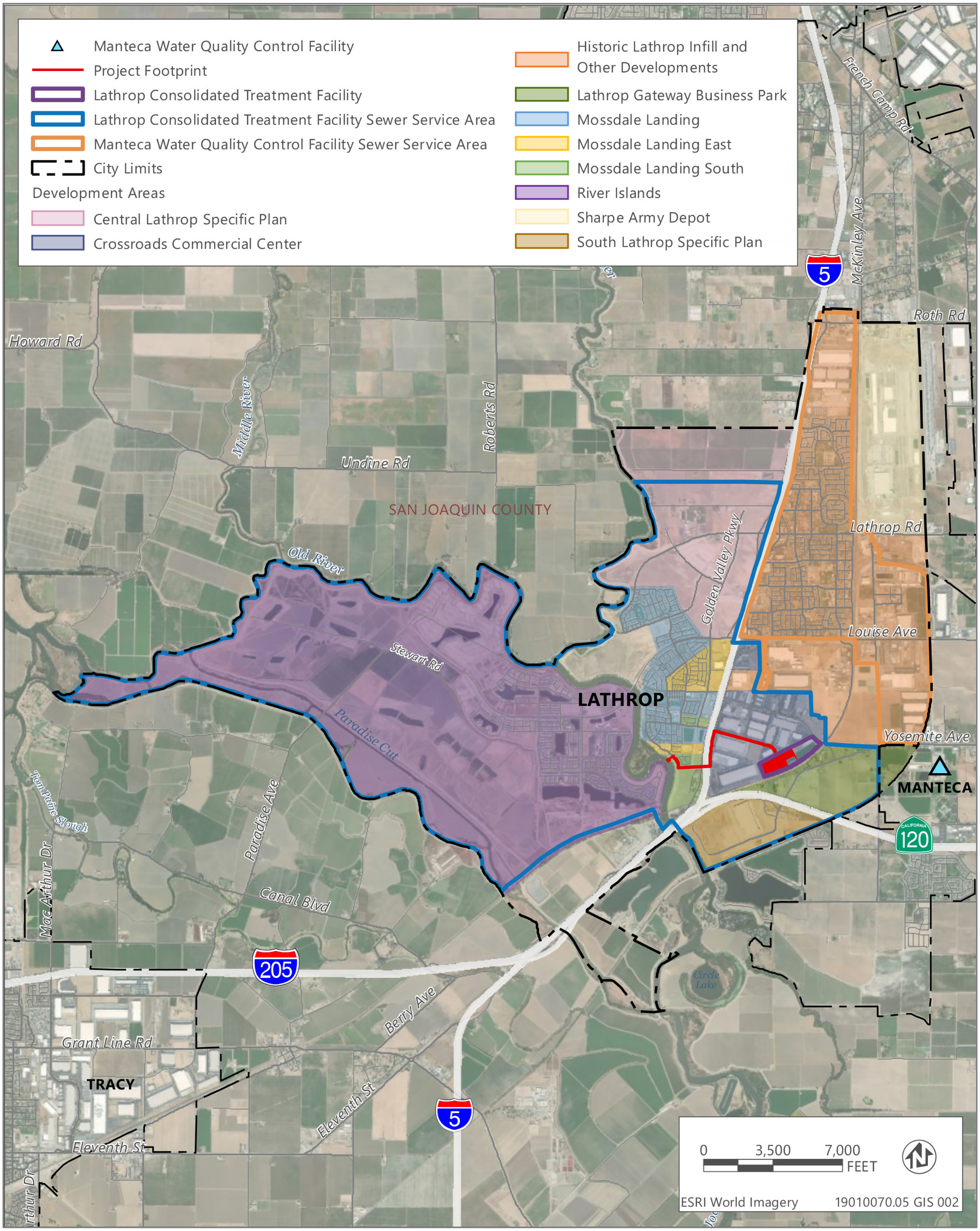
Wastewater from the City of Lathrop is treated at two separate facilities: the City of Manteca (Manteca) Water Quality Control Facility (WQCF) and the CTF. The Manteca WQCF treats most of the wastewater generated in the City east of I-5 and north of Louise Avenue, and the CTF treats domestic and a relatively small amount of commercial wastewater from the master planned communities in the western portion of the City and commercial and industrial wastewater from the Crossroads Commercial Center area, South Lathrop, and Lathrop Gateway Business Park (Figure 2-1). Treated wastewater effluent from the Manteca WQCF is primarily disposed of by discharge to the San Joaquin River at river mile 57. Treated wastewater effluent from the CTF is stored in aboveground lined ponds and used for public landscape and agricultural irrigation in the City or disposed of in a percolation basin (Figure 2-2).

The CTF produces treated effluent that meets the requirements for disinfected tertiary 2.2 recycled water in accordance with Title 22 of the CCR (Title 22, Division 4, Chapter 3). Recycled water is water that, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur. Disinfected tertiary 2.2 recycled water has received a very high level of treatment, sufficient for applications with public exposure, including irrigation of food crops, parks, and residential and other landscaping, and use in recreational impoundments, toilet flushing, and snowmaking. CTF effluent disposal and reuse is regulated by the Central Valley Regional Water Quality Control Board (Central Valley RWQCB) under Waste Discharge Requirements (WDRs) and Master Recycling Permit Order No. R5-2016-0028-01. Under the WDRs, the City may store disinfected tertiary treated CTF effluent in aboveground lined storage ponds before pumping it to the distribution system for irrigation of agricultural land application areas (LAAs) and public landscape areas and disposal in a percolation basin (PB-1). The CTF has an existing design treatment capacity of 2.5 million gallons per day (mgd) average dry weather flow (ADWF). The CTF's maximum discharge capability is limited by the currently permitted disposal capacity of 1.69 mgd ADWF (Central Valley RWQCB 2019).

Lathrop has the right to 14.7 percent of the existing Manteca WQCF capacity by contract with Manteca. However, Lathrop does not participate in the operation of the WQCF, nor does it receive WQCF effluent for reuse. The current ADWF design capacity of the WQCF is 9.87 mgd, and Lathrop's share of that capacity is 1.45 mgd. The projected influent ADWF rate from the Lathrop portion of the WQCF service area (i.e., Lathrop east of I-5) at buildout is 1.47 mgd (EKI 2019a:4-15). Although Manteca has the ability to expand the WQCF, it has no need to expand capacity and thus no plans to expand the WQCF. Also, because Manteca is reserving its remaining capacity to serve future development in its jurisdiction, Lathrop capacity at the WQCF is limited to 1.45 mgd.

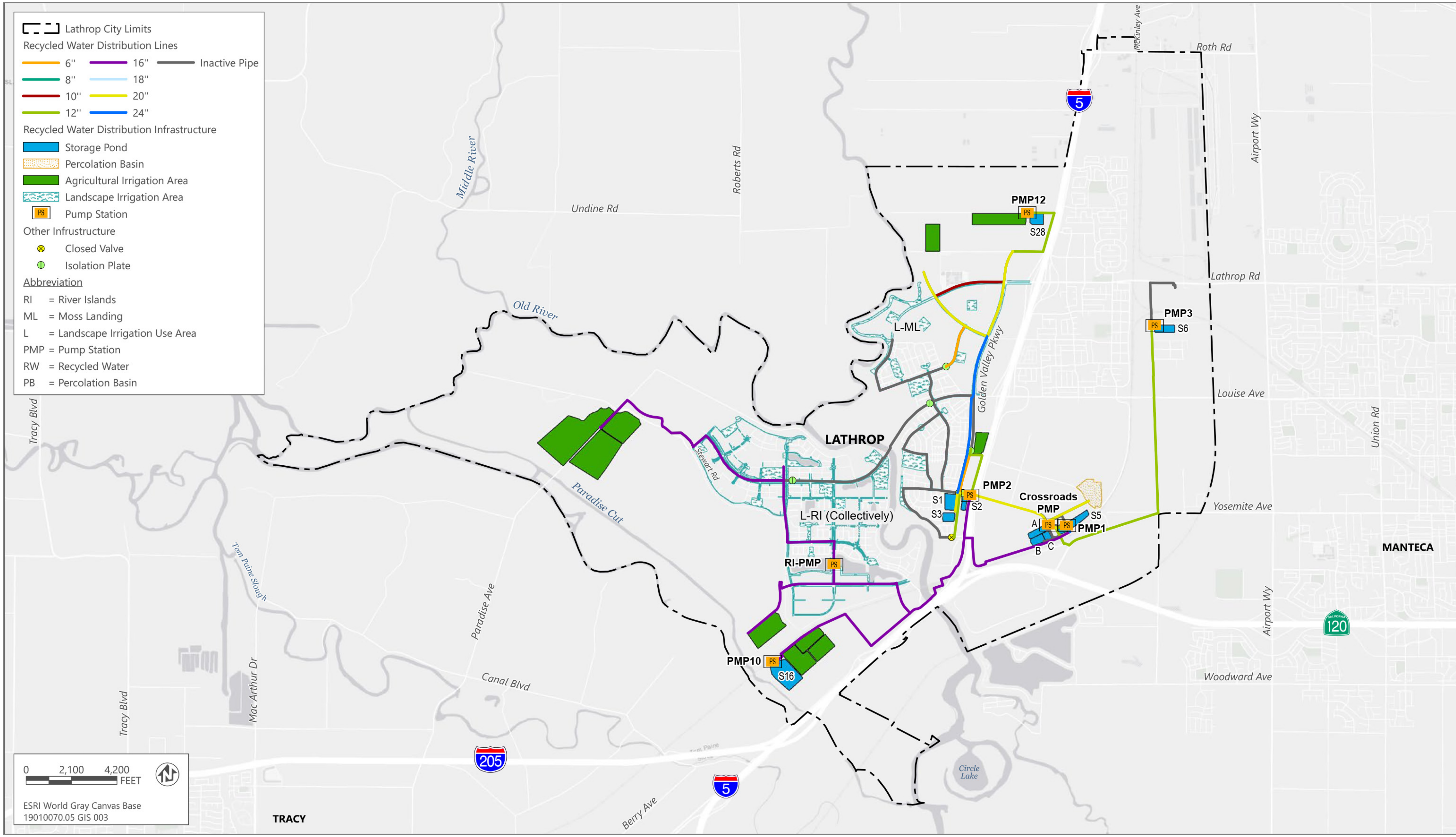
Lathrop has 10 storage ponds occupying a total of approximately 109.7 acres, one approximately 16-acre percolation basin, approximately 276 acres of agricultural LAAs, and 20.6 acres of public landscaping areas for storage and use of treated CTF effluent (Figure 2-2). PB-1 provides 0.361 mgd (approximately 132 million gallons [MG] per year) of disposal capacity. The 10 storage ponds, identified as S1, S2, S3, S5, S6, S16, S28, A, B, and C, provide 0.79 mgd (approximately 289 MG) of effluent storage. The CTF effluent is currently applied to nine agricultural LAAs, identified as A23, A28, A30, A31, A34, A35, A35b, A35c, and A36, and the various public landscaping areas throughout River Islands. This system provides about 666 MG per year of disposal capacity, or approximately 1.69 mgd ADWF.

The Lathrop General Plan designates all the agricultural LAAs except A35, A35b, and A35c and all the storage ponds except S5 and S16, which provide 129 MG of effluent storage, for commercial, residential, or urban development (Figure 2-3) (EKI 2019b). Retaining this land for effluent storage and disposal would prevent development of the properties in accordance with the general plan land use designations. However, the influent ADWF rate at buildout in the CTF service area is projected to be 5.2 mgd (EKI 2019a). At buildout of the City, including expansion of its recycled water distribution system and increase in landscaping, the amount of land available for landscape irrigation of trees, shrubs, and grass is projected to increase from the currently permitted amount of 20.6 acres to approximately 780 acres (EKI 2020), providing approximately 1,032 MG per year of disposal capacity, or approximately 2.83 mgd on an



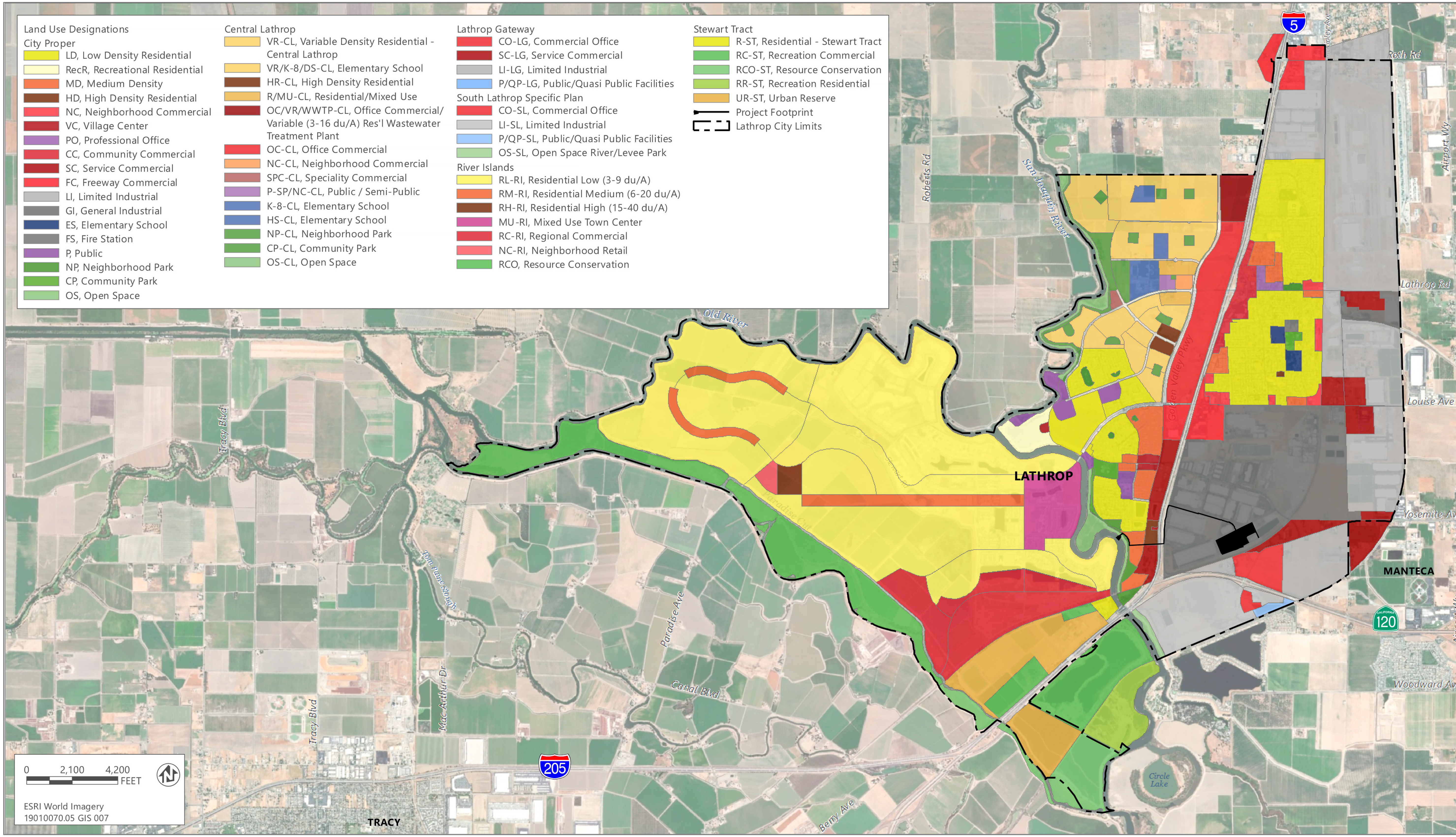

Source: Adapted by Ascent Environmental in 2020

## Figure 2-1 Lathrop CTF and Manteca WQCF Service Areas in the City of Lathrop




Source: EKI 2019b, adapted by Ascent Environmental in 2020

Figure 2-2 Lathrop Recycled Water System Infrastructure




Source: Data received from City of Lathrop and adapted by Ascent Environmental in 2020

Figure 2-3 Lathrop General Plan Land Use Designations average annual basis (EKI 2020). Although this increase in landscape irrigation area at buildout is substantial, irrigation demand varies by season. At buildout, effluent production at the CTF, during the low-irrigation/nonirrigation months of October through April in particular, is projected to exceed the City's available land-based effluent storage, reuse, and disposal capacity (RBI 2019:13–14).

Therefore, the City is proposing to establish a direct discharge of CTF-generated and dechlorinated Title 22 disinfected tertiary 2.2 effluent to the San Joaquin River for use when generation of treated CTF effluent would exceed the capacity of the City's recycled water system to store and reuse treated effluent for landscape irrigation. The majority of CTF effluent would be discharged to the San Joaquin River during winter, when irrigation demands are low and river flow is relatively high, and less would be discharged during the irrigation season, when reuse of CTF recycled water would be maximized for landscape irrigation. This approach would allow land designated under the general plan for urban uses to be developed in accordance with the plan.

The City intends to obtain an initial National Pollutant Discharge Elimination System (NPDES) permit to discharge up to 2.5 mgd ADWF of dechlorinated treated effluent (current ADWF treatment capacity of the CTF) to the San Joaquin River. However, the effluent discharge pipeline and outfall would be designed to accommodate CTF flows at buildout. As discussed in Chapter 1, "Introduction," based on the current general plan and the City's current wastewater and recycled water master plans (EKI 2019a, 2019b), CTF flows at buildout are projected to be 5.2 mgd ADWF. However, based on potential cumulative development proposed in the City, buildout of the City, if approved, could generate approximately 6 mgd ADWF (EKI 2020). Therefore, the analysis in this EIR evaluates the environmental impacts of wastewater generation and discharge of up to 2.5 and 5.2 mgd ADWF to the San Joaquin River under the proposed project, and considers the incremental contribution of future cumulative wastewater generation and discharge to the San Joaquin River of up to 6 mgd ADWF.

# 2.2 PROJECT OBJECTIVES

The proposed project has the following objectives:

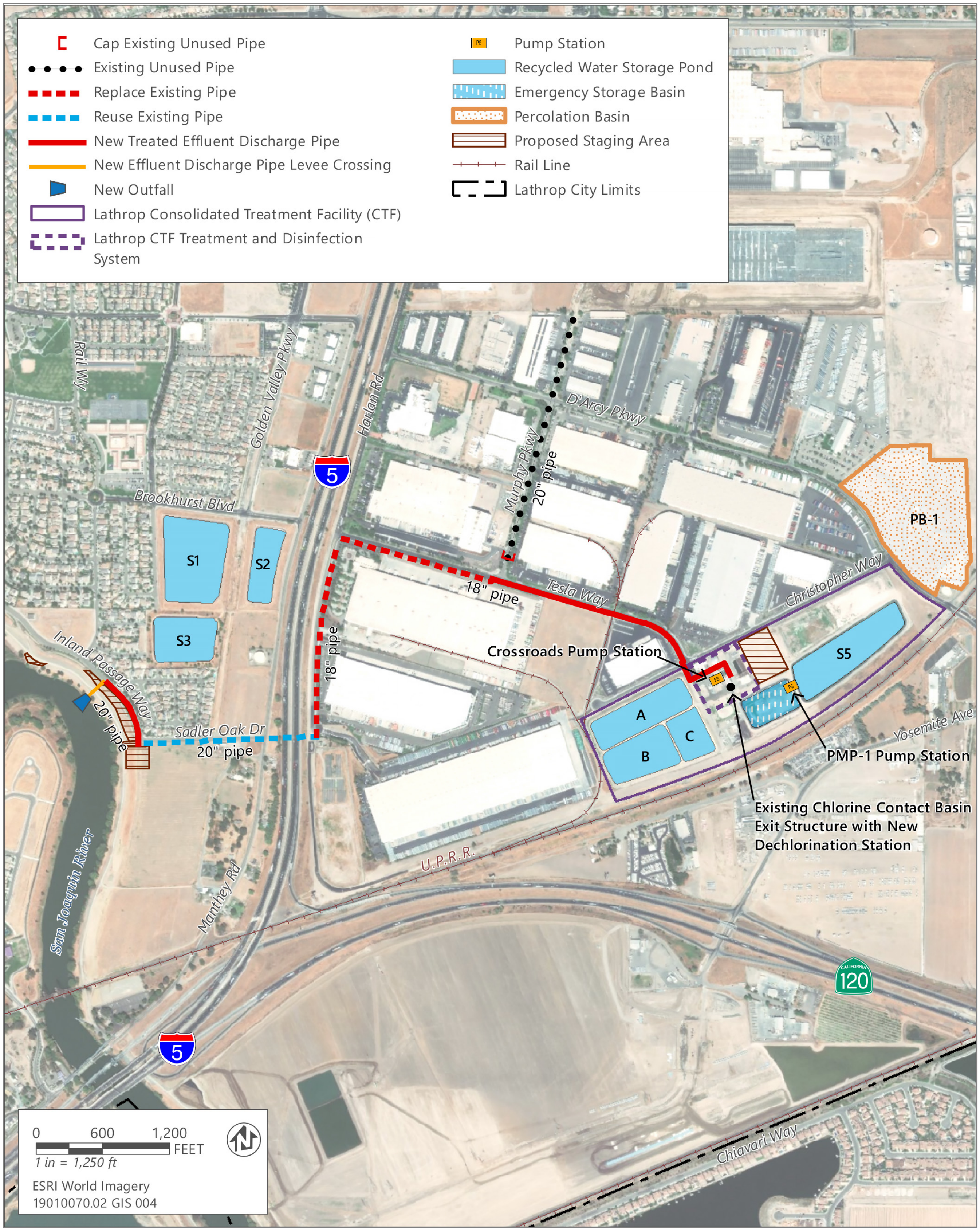
- Provide for planned City buildout and development based on the City's General Plan by providing effluent discharge to the San Joaquin River.
- Provide efficient and cost-effective wastewater services through buildout of the City.
- Maximize use of recycled water in the City presently and in the future.

# 2.3 PROJECT LOCATION

Elements of the proposed project would be constructed (1) at the City's existing CTF, located on 54 acres of City-owned land at 18800 Christopher Way, Lathrop, CA; (2) along roadways in Lathrop between the CTF and the San Joaquin River, including Tesla Way, Harlan Road, and Inland Passage Way; and (3) along the right bank of the San Joaquin River, approximately 0.7 mile downstream of the I-5 overcrossing, at approximately river mile 55.8 (Figure 2-4).

# 2.4 PLANNED LAND USES AND DEVELOPMENT

Located within the I-5 corridor, Lathrop is within an approximately 50-minute drive of the Cities of Tracy, Manteca, Stockton, Lodi, Modesto, Livermore, and Pleasanton, and it has a population of approximately 27,000 (DOF 2020). It is considered one of northern California's fastest growing master planned communities (City of Lathrop 2016). The projected population for 2020 through buildout is provided in Table 2-1.




Source: Data received from EKI and adapted by Ascent Environmental in 2020

Figure 2-4 Proposed Project Site

**Table 2-1 Projected Population for the City of Lathrop**

| Year | 2020 | 2025 | 2030 | 2035 | 2040 | Buildout |
|---|---|---|---|---|---|---|
| Population | 26,833 | 46,808 | 60,516 | 70,000 | 76,951 | 96,832 |

Notes: Current population estimates and projected populations for 2025 through 2040 and buildout are based on residential unit counts from Table 2-1 in the City's Recycled Water Master Plan, multiplied by the City's person per dwelling units figure reported by the California Department of Finance in 2010 based on census data (3.77 persons per dwelling unit).

Sources: DOF 2016, EKI 2019b

The projected population growth is based on several approved or pending large master planned developments within the City limits. Lathrop was originally developed primarily east of I-5. However, most of the major new development is west of I-5. The following development locations are shown in Figure 2-1:

- **River Islands.** This 4,995-acre development is located west of the San Joaquin River and east of Paradise Cut on Stewart Tract, with two development phases. Phase 1, which includes 4,284 dwelling units, a Town Center, a business park, and other supporting uses, is under construction. Phase 2 was approved to include 6,716 dwelling units, a business park, and other supporting uses. An application to increase the amount of housing to 10,726 units in Phase 2 has been submitted and is under City review. An EIR evaluating the increase in the number of residences is in preparation. River Islands currently consists of approximately 1,500 homes. The community typically adds between 400 and 500 homes per year.
- **Central Lathrop Specific Plan.** The Central Lathrop Specific Plan (CLSP) proposes development of 1,520 acres located west of I-5 which began in 2019. Project completion is anticipated by 2050. The CLSP proposes approximately 6,790 low-, medium-, and high-density residential units. City staff also indicated that 316 acres are proposed for office/commercial land uses (Gebhardt, pers. comm., 2019, as cited in RBI 2019). The project also includes two schools and 200 acres of recreational land use and open space.
- **Mossdale Village Specific Plan.** Mossdale Village is a 1,161-acre development with service commercial and highway commercial uses organized around an associated pedestrian-oriented village center located west of I-5 and east of the San Joaquin River. It is divided into three separate planning areas:
  - **Mossdale Landing.** Mossdale Landing, located west of I-5 and just south of the CLSP project, is a mixed-use master planned community consisting of approximately 1,700 dwelling units, approximately 654,000 square feet of village and service commercial uses, schools, parks, and open space.
  - **Mossdale Landing East.** Mossdale Landing East, located west of I-5 and just south of River Islands Parkway, is a mixed-use master planned community consisting of approximately 485 dwelling units; approximately 500,000 square feet of highway commercial, village commercial, and service commercial uses; parks; and open space.
  - **Mossdale Landing South.** Mossdale Landing South, located south of the Mossdale Landing site, is a proposed 104-acre development that is planned to be completed by 2030. The development will consist of 297 medium-density residential units. In addition, the project proposes 28 acres of commercial uses, 25 acres of open space, and 9.5 acres of parks.
- **Historic Lathrop Infill and Other Developments East of I-5.** The portion of the City east of I-5 is anticipated to expand and add density in the future. Currently, this area consists of approximately 2,886 low-density and 78 medium-density units, commercial and industrial areas, and a few public parks. Future residential growth in this area is expected on undeveloped/underused and redeveloped parcels consolidated from large lots where low-density residential units would be demolished. All new residential projects are projected to consist of medium-density residential units (i.e., small lot sizes). At buildout, the area will consist of 2,746 low-density and 894 medium-density residential units.
- **South Lathrop Specific Plan.** The South Lathrop Specific Plan proposes approximately 10 acres of commercial office uses, 246 acres of limited industrial, 31 acres of open space, and 27 acres of roads and public facilities.

- **Crossroads Commercial Center.** The Crossroads Commercial Center includes commercial and industrial uses on approximately 528 acres north and east of the intersection of I-5 and SR 120.
- **Lathrop Gateway Business Park.** The Lathrop Gateway Business Park is located south of Vierra Road and Yosemite Avenue, between two Union Pacific Railroad tracks that pass through southern Lathrop, east of the I-5 freeway and north of SR 120. The project consists of 168 acres of limited industrial uses and approximately 77 acres of roads and public facility sites. The remaining 57 acres of commercial office uses and 83 acres of service commercial uses remain outside of the City limits.
- **Sharpe Army Depot.** During World War II, the U.S. Army created the Sharpe Army Depot (1941) in the rural Lathrop community to allow shipment of major army supplies to the western United States. The depot, composed of a 724-acre facility south of Roth Road, has served both the Army and Air Force with a variety of supplies depending on the demand of goods and supplies created by wartime efforts.

  Sharpe Army Depot was made part of the Lathrop's City limits as part of the 1989 incorporation and is entirely self-contained—meaning that all public services normally necessary to serve urban development, such as water, sewer, storm drainage, and police and fire services, are provided by the Army. Although the depot is self-contained, the Army is decommissioning the property and requiring that the responsibility of municipal utilities for the entire area, including sewer collection, treatment, and disposal, be transferred to the City. The City of Lathrop does have a water intertie, or connection, to the depot to be used only in the case of an emergency.

Since its incorporation in 1989, the City has maintained an aggressive approach to organized growth. Over the past two decades, Lathrop, in conjunction with the San Joaquin Partnership (a regional nonprofit economic development corporation), has worked to attract San Francisco Bay Area companies looking to expand their industrial, logistics, manufacturing, commercial, and retail businesses. Businesses such as Tesla, In-n-Out, Ghirardelli, Kraft Heinz, John Deere, Super Stores Industries, Simwon America, and Wayfair have elected to locate in Lathrop. The regional partners have been able to bring thousands of jobs to San Joaquin County in the last two decades, and the annual unemployment rate declined from 16.5 percent in 2010 to 4.3 percent in 2019 (EDD 2020).

General plan land use designations for the development areas in the City of Lathrop are shown in Figure 2-3.

## 2.5 EXISTING CONSOLIDATED TREATMENT FACILITY AND RECYCLED WATER OPERATIONS

The CTF serves the CLSP and Mossdale Village Specific Plan communities, Crossroads Commercial Center, South Lathrop Specific Plan area, and Lathrop Gateway Business Park. The service area currently includes approximately 8,450 acres consisting of a population of approximately 12,500 residents, and at buildout, the population in the CTF service area is projected to be 80,165 residents (EKI 2019a).

The City completed an expansion and upgrade of the CTF in 2019, resulting in its current design treatment capacity of 2.5 mgd (ADWF). Daily operations of the CTF are contracted to a private contractor, Veolia Water NA, and require six full-time-equivalent employees.

The CTF provides secondary and tertiary treatment/filtration, and disinfection of wastewater flows, producing effluent that meets the requirements of disinfected tertiary 2.2 recycled water in accordance with Title 22 of the CCR. The CTF consists of the following system components:

- Headworks
  - Packaged fine and ultra-fine screening and grit removal headworks system
  - Odor control system

- Secondary Process
  - Influent, basin drain, and mixed liquor suspended solids process and membrane filtration process structure
  - Activated sludge treatment process, including valves, gates, mixers, pumps, and process air diffusers
  - Four aeration blowers
- Tertiary Process
  - Three membrane-bioreactor filtration trains
  - Four membrane scouring blowers
- Disinfection Process
  - One chlorine contact basin
- Sludge Handling
  - Two waste-activated sludge pumps
  - Two scum pumps
  - Sludge-drying pad area
- Power and Control
  - Two standby generators
  - Motor control center equipment
  - Programmable logic controller and Supervisory Control and Data Acquisition (SCADA) system
  - Field instrumentation for treatment processes
- Recycled Water Storage and Pumping
  - Four on-site storage basins (S5, A, B, and C)
  - Two pump stations (PMP-1 and Crossroads Pump Station)
- Buildings
  - Administration, Lab, and Maintenance Building
  - Mechanical Treatment Building
- Safety and Employee Relations
  - Heating, ventilation, and air-conditioning equipment
  - Safety ladders and grating for access to equipment and subgrade structures
  - Site lighting at critical process areas
  - Warning signs

Following treatment and disinfection, the effluent exits the chlorine contact basin and flows by gravity to a high-density polyethylene–lined effluent storage reservoir or pond (Pond S5), after which it is pumped into the recycled water distribution system via recycled water Pump Station 1 (PMP-1) (Figure 2-5). Between the months of October and March, recycled water is stored in Pond S5, three additional ponds on the CTF site (A, B, and C), and six additional ponds distributed throughout the recycled water distribution system (S1, S2, S3, S6, S16, and S28) and then discharged and reused for irrigation of agricultural LAAs in the Mossdale Landing, CLSP, and River Islands developments and landscape irrigation areas in the Mossdale Landing, CLSP, and River Islands developments.

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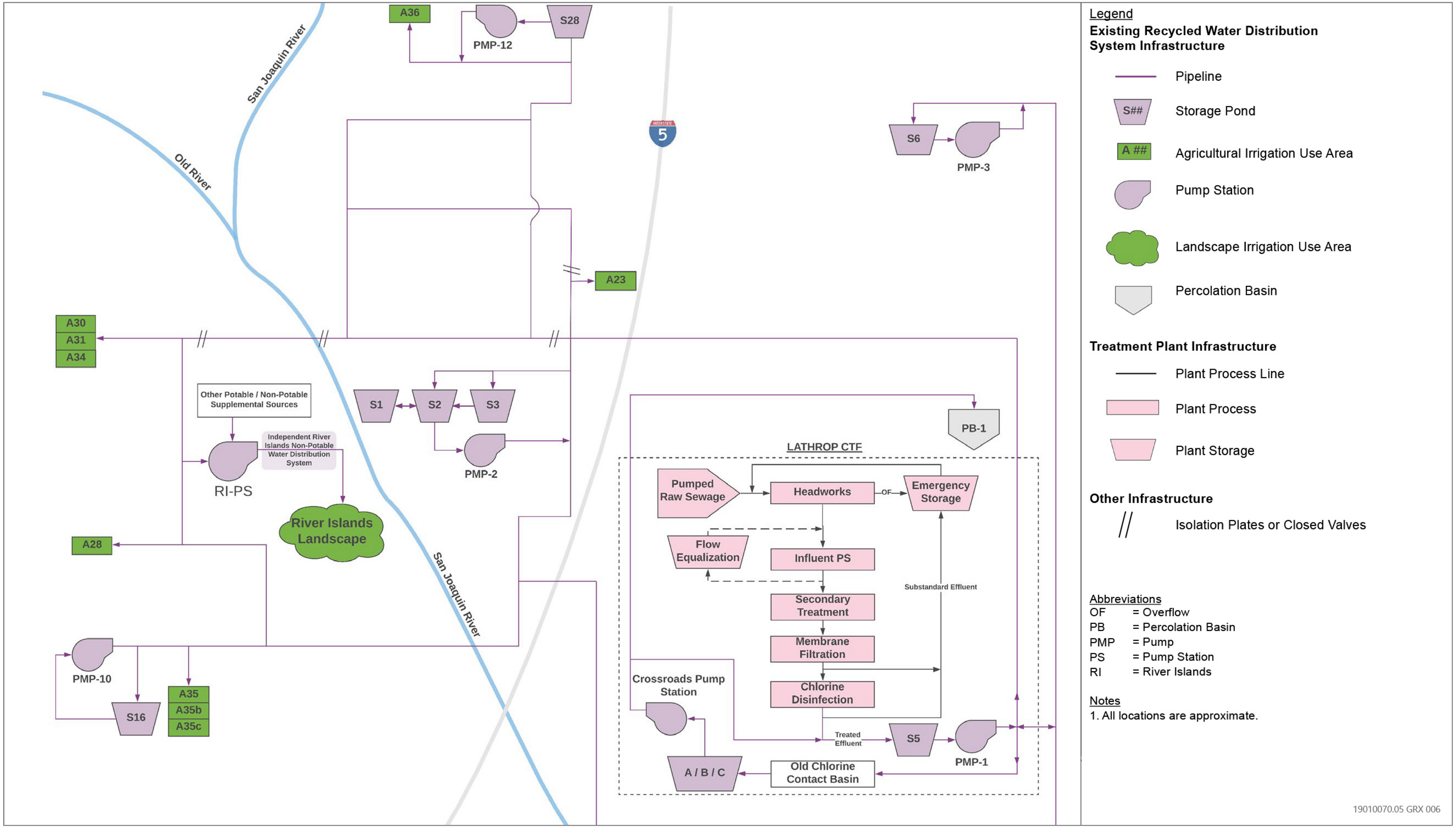



Source: Data received from EKI and adapted by Ascent Environmental in 2020

Figure 2-5 Existing CTF and Recycled Water Operations Flow Diagram

# 2.6 PROPOSED PROJECT

The proposed project involves modifications to the CTF, installation of effluent pipelines, and construction of an effluent pipeline levee crossing and outfall structure (Figure 2-4). These elements of the proposed project are described below.

## 2.6.1 CTF Modifications (to Support 2.5-mgd Surface Water Discharge)

The CTF uses chlorine to provide disinfection of treated effluent for discharge to the LAAs. However, effluent proposed to be discharged to the San Joaquin River would require dechlorination before discharge to be compliant with an NPDES Permit and to avoid adverse effects to aquatic species. Therefore, to allow continued distribution of chlorinated CTF effluent for recycled water use, as well as discharge of dechlorinated CTF effluent to the San Joaquin River when effluent flows exceed demand for recycled water, the City is proposing to implement the wastewater treatment system modifications summarized below and shown in Figure 2-6:

- Repurpose the containment area for sodium bisulfite storage.
- Disconnect the effluent connection line at the base of the exit structure connecting the chlorinated effluent pipeline to Pond S5 and PMP-1, and install approximately 500 linear feet (LF) of new 24-inch polyvinyl chloride (PVC) dechlorinated effluent suction pipeline from the base of the exit structure to the Crossroads Pump Station.
- Install a sodium bisulfite injector unit in the base of the exit structure of the chlorine contact basin to provide dechlorination.
- Install a new gravity-fed effluent connection line near the top of the exit structure and reconnect the exit structure to the chlorinated effluent pipeline to Pond S5 and PMP-1.
- Repurpose Storage Ponds A, B, and C and install new valves in existing pipelines to direct the effluent flow to and from Storage Ponds A, B, and C for use to cool final effluent before river discharge, as needed. If the initial years of operation indicate that the use of one or more of these ponds is not needed for effluent cooling, the pipelines associated with the unneeded ponds and the Crossroads Pump Station would be modified and the unneeded ponds decommissioned (up to approximately 23 acres).
- Disconnect approximately 800 LF of the 12-inch recycled water line between the Crossroads Pump Station and Pond S5.
- Disconnect and abandon a portion of the 20-inch recycled water line currently connecting the Crossroads Pump Station to PB-1.
- Repurpose approximately 600 LF of the section of 20-inch recycled water line between the Crossroads Pump Station and PB-1, and install approximately 85 LF of 18-inch line to connect the repurposed 20-inch line to the CTF headworks for use as a return line for dechlorinated effluent from the Crossroads Pump Station to the CTF headworks.
- Reconnect the other section of 20-inch recycled water line still connected to PB-1 to an existing 12-inch recycled water line that connects to PMP-1 and Pond S5.
- Connect the exit header from the Crossroads Pump Station to the new 18-inch effluent discharge pipe to pump dechlorinated effluent to the river.
- Install appropriate automatic valves and/or pump shutoff controls at the Crossroads Pump Station, and reprogram the programmable logic controller to monitor dechlorinated effluent quality and control pumping of dechlorinated effluent to the river or return it to the CTF headworks when effluent quality does not meet the criteria for discharge to the river.
- Install appropriate valves and temperature monitoring and controls at the Crossroads Pump Station, and reprogram the programmable logic controller to monitor effluent temperature and allow diversion of effluent to Ponds A, B, and C when required for effluent cooling prior to discharge to the river.

## 2.6.2 Effluent Discharge Pipeline (to Support 2.5 mgd and Buildout Surface Water Discharge)

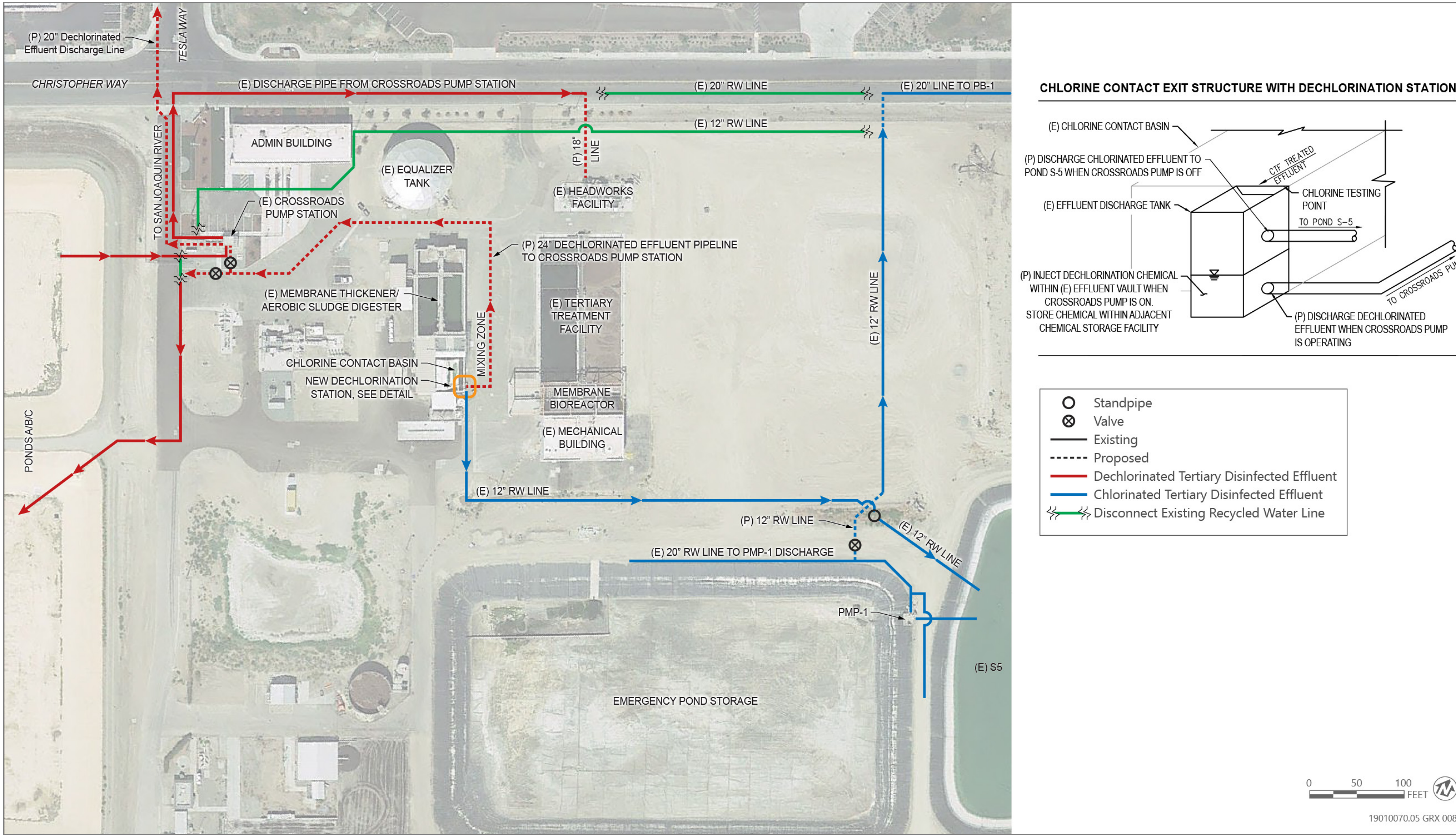
The proposed project requires a dedicated effluent discharge pipeline connecting the Crossroads Pump Station at the CTF to a new outfall along the San Joaquin River. The City would install a pipeline sufficiently sized to discharge effluent associated with general plan buildout as summarized below (Figure 2-4):

- Install approximately 5,300 LF of new 18-inch PVC pipe from the Crossroads Pump station at the CTF along Tesla Way to its intersection with Harlan Road and continuing south along Harlan Road to approximately 30 feet north of the turnaround adjacent to I-5. This would require crossing a rail spur line along Tesla Way and capping an existing 20-inch pipeline adjacent to Murphy Parkway upstream of its intersection with Tesla Way.
- Reuse approximately 1,500 LF of an existing 20-inch steel pipe crossing under the freeway from Harlan Road to Sadler Oak Drive and continuing along Sadler Oak Drive to its intersection with Inland Passage Way.
- Install up to approximately 600 LF of new 20-inch PVC pipe from Sadler Oak Drive north along Inland Passage Way and then continuing another approximately 100 LF southwest from this point to the toe of the Reclamation District (RD) 17 levee.
- Install a valve system to allow manual diversion of stagnant water in the discharge pipeline to the Mossdale sewer system for return to the CTF headworks following periods of no discharge to the river.

## 2.6.3 Levee Crossing and Outfall Structure (to Support 2.5-mgd and Buildout Surface Water Discharge)

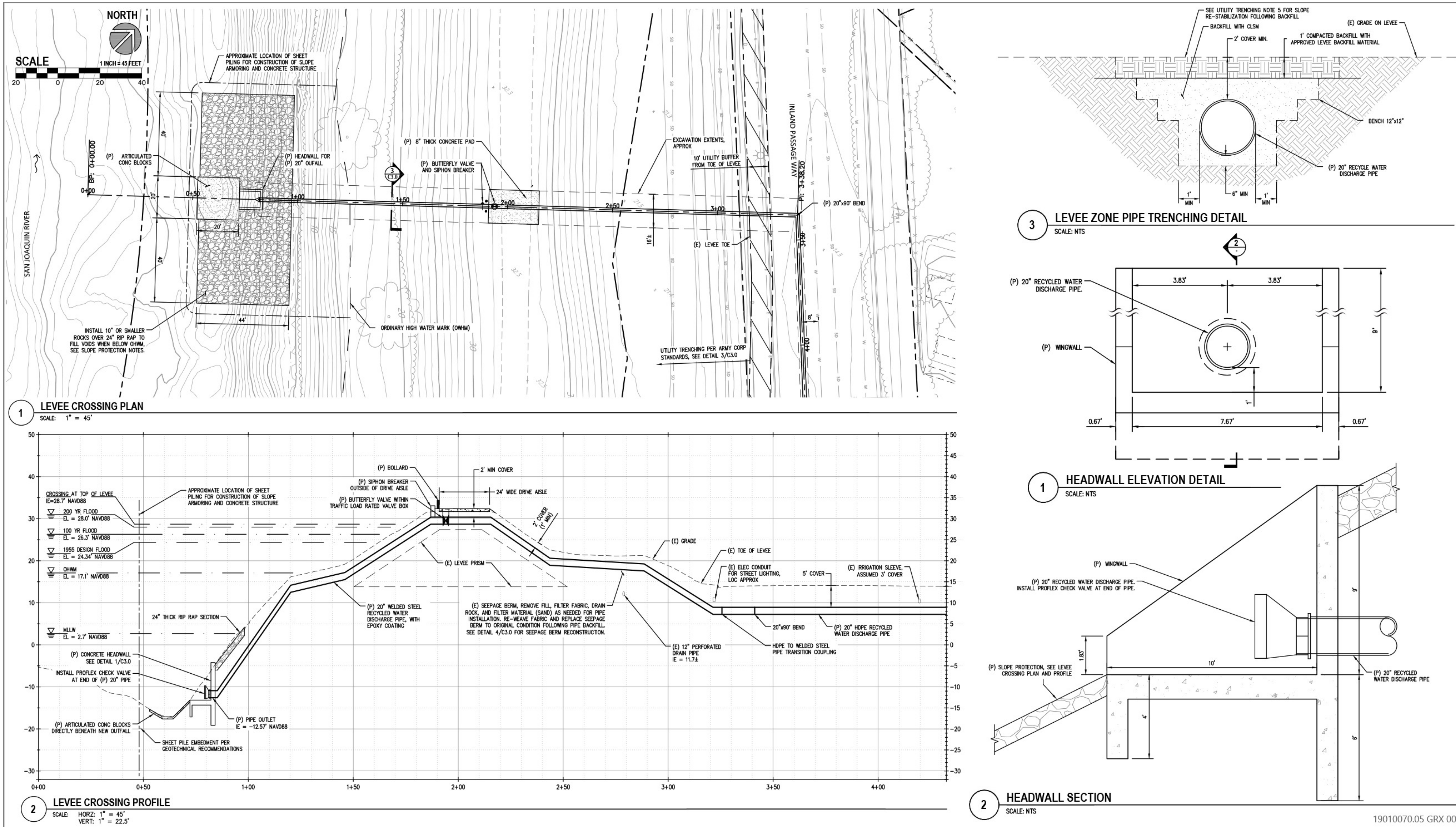
The proposed CTF outfall would be located along the right bank of the San Joaquin River on the waterside of an existing State Plan of Flood Control and Federal Flood Control Project levee maintained by RD 17. Construction of the proposed effluent pipeline across the levee and the new side-bank outfall is summarized below and shown in Figure 2-7:

- Install approximately 250 LF of new 20-inch welded steel pressurized pipe in an approximately 16-foot-wide trench excavated through the levee seepage berm and levee prism above the 200-year water surface elevation from the levee toe to the proposed outfall on the waterside of the levee.
- Extend the new 20-inch pipe to the river, and construct a new concrete-encased outfall structure approximately 19–20 feet below the mean lower low water level and above the channel bed of the San Joaquin River at approximately river mile 55.8 to create a new side-bank outfall. The elevation of the pipe at the outfall location would be set to ensure discharge of effluent sufficiently low to achieve adequate mixing with river water such that an increase in ambient surface water temperature of no more than 4 degrees Fahrenheit would be observed at any time during the year.
- Install approximately 100 LF (4,500 square feet) of erosion protection material (e.g., articulated concrete block, riprap) above and below the headwall and extending upstream and downstream of the outfall to prevent scour.




Source: Data received from EKI and adapted by Ascent Environmental in 2020

Figure 2-6 Proposed CTF Modifications Plan




Source: Data received from KPFF and adapted by Ascent Environmental in 2020

Figure 2-7 Levee Crossing and Outfall Structure Plan View and Profile

# 2.7 PROJECT CONSTRUCTION

## 2.7.1 Construction Schedule and Sequencing

Construction of the proposed project, except for any decommissioning of Storage Ponds A, B, and C, is anticipated to begin in spring 2021 and be completed by the end of 2021. Separate contracts to construct the effluent pipeline, the CTF modifications, and the levee crossing and outfall structure would be implemented, and all three of these major components would proceed concurrently to the extent feasible. For purposes of the analysis in this EIR, it is assumed any decommissioning of Storage Ponds A, B, and C at the CTF would not occur until after completion of all the other major project components and an adequate period of CTF operation (through one or more winter seasons) to confirm that the ponds would not be needed for effluent cooling.

Construction would occur from 7 a.m. to 5 p.m. on weekdays. The construction duration required to complete each of the three major project components as well as storage pond decommissioning, is summarized in Table 2-2. These durations include 1 week for mobilization before construction and 1 week for demobilization following completion of construction.

**Table 2-2 Construction Duration for Major Project Components**

| Project Component | Duration (weeks) |
|---|---|
| Effluent pipeline from CTF to landside levee toe | 24 |
| CTF modifications (not including decommissioning of Ponds A, B, and C) | 22 |
| Pipeline levee crossing and outfall structure | 8 |
| Decommissioning of Ponds A, B, and C (if not needed for effluent cooling) | 4 |

Source: Allwardt, pers. comm., 2020

The general construction window for work involving the levee in this region is seasonal, July 1 through November 1, because high-water levels in the San Joaquin River system typically occur during the period of November through June. Therefore, construction of the levee crossing and outfall is expected to be limited to the July 1 through November 1 work period. However, depending on hydrologic conditions and subject to compliance with species work windows, a work window variance that allows an extension outside the July 1 through November 1 work period may be granted by the Central Valley Flood Protection Board (CVFPB). Approval of any work window variance by CVFPB would be based on river stages, reservoir conditions, and the rainfall forecast. CVFPB may identify additional conditions and commitments as a component of any work window variance. For example, a work window variance would typically require that the contractor have the ability to restore the work area to a safe condition within about 5 days. Work window variances are not typically granted in advance (i.e., more than 2 weeks from when a variance may be needed).

## 2.7.2 Construction Equipment, Staging Areas, and Import/Export

The estimated type and quantity of construction equipment, materials, and haul trips and the volume of earthmoving required to construct the proposed project are summarized in Appendix B. Staging of equipment and materials during construction would occur primarily at the CTF and in the areas shown in Figure 2-8 but may also occur adjacent to the roadways in existing public utility easements where present. Anticipated haul routes and proposed staging areas are also shown in Figure 2-8. A total of approximately 668 round-trip haul trips using 10-cubic-yard dump trucks would be required to import and export material (including pipe, riprap, debris, and other materials) during construction of all three project components. Another 117 round trips using 8-cubic-yard cement trucks would be necessary to install the discharge pipe through the levee and construct the outfall structure. Imported material would be delivered from up to 18 miles away from the project site, and debris would be exported (approximately five loads) up to 15 miles off-site for disposal in a permitted landfill.


Source: Data received from KPFF and adapted by Ascent Environmental in 2020

Figure 2-8 Proposed Haul Routes and Staging Areas

## 2.7.3 Construction Methods and Labor Force

This section summarizes the proposed methods that would be used and the number of workers anticipated during peak construction of each major project component.

### CTF MODIFICATIONS

The CTF modifications, shown in Figure 2-6, would require excavation of approximately 1,500 LF of trench using the open-cut method and installation of new pipeline ranging in size from 12 inches in diameter to 24 inches in diameter. A new sodium bisulfite delivery system, including valving and controls to inject sodium bisulfite into the chlorinated effluent stream at the bottom of the chlorine contact basin exit structure, would be installed.

CTF modifications would also involve installation of additional valving and effluent quality and temperature monitoring systems at the Crossroads Pump Station and reprogramming of the programmable logic controller panel located in the membrane bioreactor building. In addition, sodium bisulfite storage would require installation of a new storage tank in the chemical containment area adjacent to the chlorine contact basin exit structure.

If Ponds A, B, and C (or a subset of these ponds) are determined in the future not to be needed for effluent cooling, the suction line used to connect the ponds to the pump station would be abandoned in place, and one, two, or all three of these ponds would be removed from service by removing the existing liner and support structures, including intake structures, fill lines, and water service, and then filling the pond or ponds and grading the area flat. The berms surrounding each pond that would undergo decommissioning would be used to fill them such that no import would be required. After grading is complete, the area would be hydroseeded to stabilize the soil and prevent erosion.

The average daily work force required to complete the CTF modifications is estimated to be 25 construction workers.

### EFFLUENT PIPELINE FROM THE CTF TO THE LANDSIDE LEVEE TOE

An unused 18- to 20-inch pipeline, originally constructed by the Libby Owens Ford (LOF) glass factory, exists along a large portion of the proposed effluent pipeline alignment. The City intends to reuse this pipeline to the extent possible. However, because the condition of most of the pipeline would not be determined before construction, it has been assumed for the purposes of the analysis in this EIR that all the existing LOF pipeline except the section along Sadler Oak Drive from the south end of Harlan Road to Inland Passage Way would not be usable and would be replaced.

Except in one location along Tesla Way between Christopher Way and Murphy Parkway where the jack-and-bore method would be used to install the new effluent discharge pipeline to cross an existing private rail spur, new or replacement effluent discharge piping would be installed using the open-cut trench method. Before excavation, the contractor would coordinate with utility companies to avoid or move existing utilities. A trench would be excavated in the existing road right-of-way or adjacent public utility easement, and the new PVC piping would be placed on proper bedding material and backfilled in accordance with City standards. Then the disturbed roadway and other surfaces would be returned to preproject conditions.

Before connecting any new pipe to the existing LOF pipeline in Tesla Way, the section of unused LOF pipeline along the west side of Murphy Parkway just north of the intersection with Tesla Way would be capped (Figure 2-4). Effluent pipeline installation would require crossing a private rail spur along Tesla Way.

Excavation and use of a core drill machine would allow valving to divert stagnant water in the discharge pipeline to the Mossdale sewer system for return to the CTF. Diversion to the Mossdale sewer system is proposed after periods of no river discharge.

Installation of the effluent pipeline would require crossing storm, sewer, and water laterals throughout the project alignment. The proposed pipeline depth would be adjusted vertically as needed at any crossings to limit the need for relocation of any existing utilities. The City would require an encroachment permit for any work in the public right-of-way.

Roadways that would be affected during pipeline installation would consist of Christopher Way, Tesla Way, Murphy Parkway, Harlan Road, Sadler Oak Drive, and Inland Passage Way. In compliance with the application process for a City Encroachment Permit for pipeline work in the road rights-of-way and the potential need for temporary lane closures along these roadways, a traffic control plan would be prepared by the construction contractor before implementation of construction activities that may affect any of these road rights-of-way (City of Lathrop 2020). The traffic control plan would follow California Department of Transportation standards (i.e., Chapter 6C of Revision 5 to the 2014 Edition of the *California Manual on Uniform Traffic Control Devices* [Caltrans 2020]) and would identify measures that would ensure continued access to adjacent land uses (e.g., residences, industrial) and maintain emergency access. Such measures could include temporary lane closures and use of signage, traffic cones, and flaggers. During project construction, access to existing land uses would be maintained at all times. Full road closures would not be required. The average daily work force required to construct the effluent pipeline from the CTF to the landside toe of the levee at the outfall location is estimated to be 24 construction workers.

## EFFLUENT PIPELINE LEVEE CROSSING AND OUTFALL STRUCTURE

As shown in Figure 2-7, the effluent discharge pipeline would need to cross the existing RD 17 levee and be connected to a new outfall structure to be installed on the waterside of the levee. A new concrete headwall structure would be installed on the waterside of the levee, and the new discharge pipe would be connected to it at an invert elevation to be determined based on modeling to maximize effluent mixing with river water and minimize the potential increase in surface water temperatures related to the effluent discharge.

An approximately 16-foot-wide, approximately 250-foot-long trench extending from the landside toe of the levee to the waterside outfall location would be excavated. Before any construction on the waterside of the levee, a sheet pile coffer dam would be erected, and the area inside the coffer dam would be dewatered to provide a dry work area. Sheet piles (sections of sheet materials with interlocking edges) would be driven up to approximately 40 feet below the riverbed using a vibratory hammer connected to a crane that would be operated from the levee crown. Sheet piles would be placed sequentially from upstream to downstream. Interlock sealant, such as sawdust, would be applied to sheet pile joints to keep them watertight. Upon completion of the coffer dam, submersible pumps fitted with screens to protect from entraining fishes would be placed inside the coffer dam to dewater the area to provide a dry work area. Water remaining inside the coffer dam would be pumped back over the levee into temporary ponds or Baker tanks on the landside of the levee for settling, and then the supernatant (clarified river water overlying material that has settled out) would be discharged to the river or pumped into the City storm drain system depending on water quality requirements.

After the work area is dewatered, a trench on the waterside of the levee would be excavated and the discharge pipe would be installed. The discharge pipe would then be fitted with a siphon breaker and butterfly valve at the apex along the waterside levee crown to prevent backflow of river water into the pipe when the pipe is not discharging. Finally, the discharge pipe would be encased in concrete to resist uplift pressures and then backfilled with a minimum 2 feet of cover. The levee crown would also then be reinforced with an 8-inch-thick concrete pad on its surface to prevent potential damage to the pipeline in the future from trucks or heavy equipment traveling along the levee crown.

To install the headwall, base course would be built up below the headwall location, and formwork would be installed. Concrete would then be pumped into the formwork from concrete trucks on the landside of the levee. The end of the pipe would be connected to the new headwall structure and fitted with a check valve (e.g., duckbill valve) to further prevent backflow of river water into the pipe when the pipe is not discharging. Articulated concrete blocks would be installed along the riverbank below and approximately 10 feet upstream and downstream of the outfall and staked into the ground. The remaining riverbank above and below the outfall structure up to approximately 50 feet upstream and downstream of the outfall would be stabilized with 24-inch-minus riprap. Following installation of the pipe, articulated concrete block, and riprap, the sheet piles would be removed.

The average daily work force required to implement this component of the proposed project is estimated to be 16 construction workers.

This component of the proposed project would require encroachment permits from RD 17 and CVFPB, authorization pursuant to Section 14 of the Rivers and Harbors Act of 1899 (33 U.S. Code 408, hereinafter referred to as "Section 408") by the U.S. Army Corps of Engineers (USACE), a Clean Water Act Section 404 permit from USACE, a Clean Water Act Section 401 Water Quality Certification from the Central Valley RWQCB, and a notification to the California Department of Fish and Wildlife of California Fish and Game Code Section 1600 Streambed Alteration Agreement.

## 2.8 PROJECT OPERATIONS

Following completion of the proposed project, the City would use the newly automated CTF system to control the effluent river discharge and maximize reuse using the recycled water distribution system (Figure 2-9). In summer during peak demand for recycled water, chlorinated effluent would flow by gravity to Pond S5 and be used to supply the recycled water system. In late summer or early fall, when the pond level setpoints would be lowered to winter settings because of decreases in recycled water demands, the Crossroads Pump Station would be activated as needed to discharge dechlorinated effluent in excess of recycled water demand to the river, which would allow water levels in the ponds to be lowered. During winter, when CTF inflow generally exceeds irrigation demand and river water temperatures are lower, most of the effluent would be dechlorinated, held temporarily in Ponds A, B, and C, or a subset of these, as needed, to provide effluent cooling, and then discharged via the Crossroads Pump Station to the river through the new effluent discharge pipe network. In spring, when minimum pond level setpoints are raised to maximize recycled water storage and reuse again, discharge of dechlorinated effluent to the river would be reduced, and chlorinated effluent would be directed from the chlorine contact basins to fill Pond S5 and other storage ponds in the recycled water system.

Implementing the proposed project would not require any changes to staffing at the CTF or to power, telecommunications, gas, water supply, recycled water distribution, or sewer infrastructure in the near term. CTF operations would continue to be monitored and controlled using the existing SCADA system in the administration building at the CTF.

Energy demand associated with the proposed project once completed would increase slightly because of the need to incorporate a pump to inject sodium bisulfite into the effluent stream for dechlorination of the effluent before discharge to the river and because of additional pump use during some winter months to provide for effluent cooling before discharge. Otherwise, energy demand would be essentially the same as the demand associated with the existing CTF and recycled water system operations. At buildout of the CTF, energy demands associated with pumping to the river would increase relative to energy demand associated with development at the time of project completion. However, energy use associated with discharge to the river at buildout, except for an increase in energy use associated with the dechlorination system during river discharge and with effluent cooling during some winter months before river discharge, would be essentially the same as the demand associated with discharge of the effluent to land, which was previously evaluated in the 2013 CEQA document for the City of Lathrop Consolidated Treatment Facility Project (City of Lathrop 2013).

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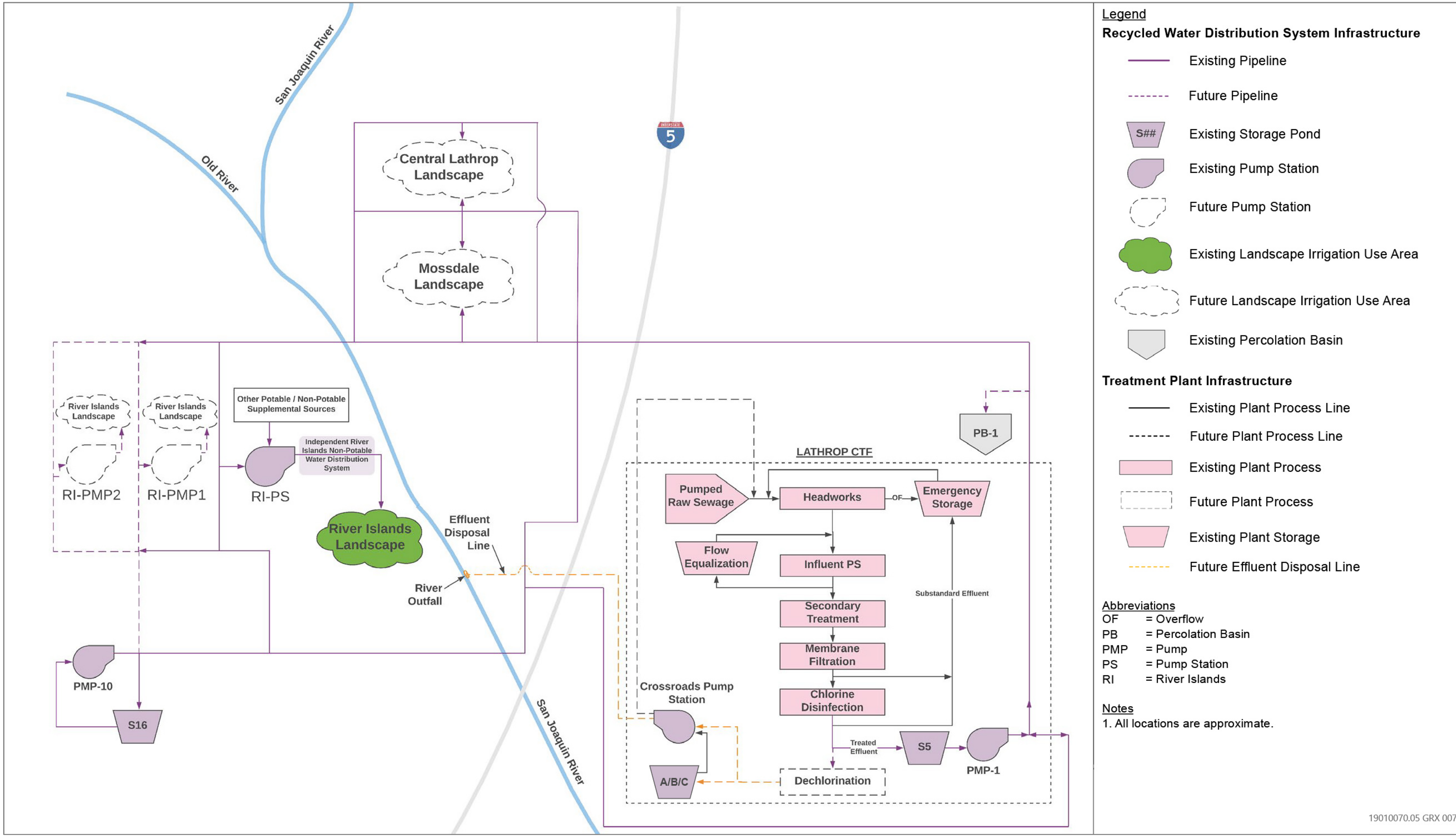


Source: Data received from EKI and adapted by Ascent Environmental in 2020

Figure 2-9 Proposed CTF, Surface Water Discharge, and Recycled Water Operations Flow Diagram

# 3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

## 3.1 APPROACH TO THE ENVIRONMENTAL ANALYSIS AND EFFECTS FOUND TO NOT BE SIGNIFICANT

### 3.1.1 Approach to Environmental Analysis

This Draft EIR evaluates and discloses the environmental impacts associated with the proposed project, in accordance with CEQA (PRC Section 21000 et seq.) and the State CEQA Guidelines (CCR, Title 14, Chapter 3, Section 15000 et seq.). Sections 3.2 through 3.10 of this Draft EIR present a discussion of regulatory background, existing conditions, environmental impacts associated with construction and operation of the proposed project, mitigation measures to reduce the level of impact, and the residual level of significance (i.e., after application of mitigation, including impacts that would remain significant and unavoidable after application of all feasible mitigation measures). Issues evaluated in these sections consist of the environmental topics identified for review in the NOP prepared for the proposed project (see Appendix A of this Draft EIR). Chapter 4, "Cumulative Impacts," presents an analysis of the proposed project's impacts considered together with other past, present, and probable future projects producing related impacts, as required by Section 15130 of the State CEQA Guidelines. Chapter 5, "Alternatives," presents a reasonable range of alternatives and evaluates the environmental effects of those alternatives relative to the proposed project, as required by Section 15126.6 of the State CEQA Guidelines. Chapter 6, "Other CEQA Sections," includes an analysis of the proposed project's growth-inducing impacts, as required by Section 21100(b)(5) of CEQA.

This EIR considers the proposed project at its current capacity of 2.5 mgd and at City buildout, 5.2 mgd.

Sections 3.2 through 3.10 of this Draft EIR each include the following components:

- Regulatory Setting: This subsection presents information on the laws, regulations, plans, and policies that relate to the issue area being discussed. Regulations originating from the federal, state, and local levels are each discussed as appropriate.
- Environmental Setting: This subsection presents the existing environmental conditions on the project site and in the surrounding area as appropriate, in accordance with State CEQA Guidelines Section 15125. The discussions of the environmental setting focus on information relevant to the issue under evaluation. The extent of the environmental setting area evaluated (the project site) differs among resources, depending on the locations where impacts would be expected.
- Environmental Impacts and Mitigation Measures: This subsection presents thresholds of significance and discusses potentially significant effects of the proposed project on the existing environment, including the environment beyond the project boundaries, in accordance with State CEQA Guidelines Section 15126.2. The methodology for impact analysis is described, including technical studies on which the analyses rely. In addition to defining the applicable thresholds of significance d, thresholds for which the proposed project would have no impact are disclosed and dismissed from further evaluation. Project impacts and mitigation measures are numbered sequentially in each subsection (e.g., Impact 3.2-1, Impact 3.2-2, Impact 3.2-3, etc.). A summary impact statement precedes a more detailed discussion of the environmental impact. The discussion includes the analysis, rationale, and substantial evidence from which conclusions are drawn. The determination of level of significance of the impact is defined in bold text. An impact identified as "less than significant" would not result in a substantial adverse change in the physical environment. An impact identified as "potentially significant" or "significant" could or would result in a substantial adverse change in the environment; both of these latter impact conclusions are treated the same under CEQA in terms of procedural requirements and the need to identify feasible mitigation. Mitigation measures are identified, as feasible, to avoid, minimize, rectify, reduce, or compensate for significant or potentially significant impacts, in accordance with the State CEQA Guidelines

Section 15126.4. Unless otherwise noted, the mitigation measures presented are recommended in the EIR for consideration by the City of Lathrop City Council to adopt as conditions of approval.

Where an existing law, regulation, or permit specifies mandatory and prescriptive actions about how to fulfill the regulatory requirement as part of the project definition, leaving little discretion in its implementation, and would avoid an impact or maintain it at a less-than-significant level, the environmental protection afforded by the regulation is considered before determining impact significance. Where existing laws or regulations specify a mandatory permit process for future projects, performance standards without prescriptive actions to accomplish them, or other requirements that allow substantial discretion in how they are accomplished, or have a substantial compensatory component, the level of significance is determined before applying the influence of the regulatory requirements. In this circumstance, the impact would be potentially significant or significant, and the regulatory requirements would be included as a mitigation measure.

This subsection also describes whether mitigation measures would reduce project impacts to a less-than-significant level. Significant and unavoidable impacts are identified as appropriate in accordance with State CEQA Guidelines Section 15126.2(b). Significant and unavoidable impacts are also summarized in Chapter 6, "Other CEQA Sections."

- **References:** The full references associated with the resources cited in Sections 3.2 through 3.10 can be found in Chapter 7, "References," organized by section number.

## 3.1.2 Effects Found Not to Be Significant

The State CEQA Guidelines (Section 15128) allow an EIR to briefly describe the reasons why some environmental effects were determined not to be significant and then to dismiss these effects from detailed review in the EIR. Implementing the proposed project would not result in significant effects related to the issue areas described below. These issue areas are dismissed from detailed review in this EIR. They are organized below based on the order of topics in the State CEQA Guidelines Appendix G Environmental Checklist Form.

- **Aesthetics:** The visual character of the project site (CTF, storage ponds, outfall) and associated staging areas is mixed and includes urban and residential developed areas and the San Joaquin River with some adjacent undeveloped open space or agricultural lands. Viewer groups in the areas consist of residents, boaters, and people recreating along the levee (e.g., biking, walking, fishing).

  The project site is not located within view of a state scenic highway. Only two highway sections in San Joaquin County are listed as a designated scenic highway by the California Department of Transportation (Caltrans): the segment of Interstate 5 (I-5) from the Stanislaus County line to I-580 and the segment of I-580 from I-5 to the Alameda County line (Caltrans 2020a). The City of Lathrop is not visible from these roadway segments. Therefore, the proposed project would not substantially damage scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway. Implementation of the proposed project would have no impact related to designated state scenic highways.

  Proposed project components that would be constructed include underground pipelines, facility improvements at the existing CTF, and a new outfall along the San Joaquin River. Although construction of the underground pipelines, outfall structure, and CTF improvements could result in short-term, temporary aesthetic impacts during construction activities associated with the presence of equipment and excavation along the levee and roadways on the project site, it would not result in permanent changes to the visual character of the project site or surrounding areas.

  The proposed new outfall along the bank of the San Joaquin River would consist of a pipe within a new concrete-encased outfall structure with approximately 100 linear feet (4,500 square feet) of erosion protection material (e.g., articulated concrete block, riprap) above and below the headwall and extending upstream and downstream of the outfall. Construction of the new outfall would retain existing protected vegetation, such as elderberry shrubs, oak trees, and other riparian vegetation (see discussions under Impacts 3.3-1 and 3.3-7 in Section 3.3, "Terrestrial Biological Resources"). Additionally, the outfall would be constructed within the profile of the riverbank and levee such that the structure would not obstruct any scenic views of the river from surrounding areas. Operation of the new outfall would include discharge of treated effluent into the river, as needed, between late fall through spring.

Although constructing the new outfall would introduce an artificial structure along the bank of the San Joaquin River, views of the site and the river would remain consistent with those of the surrounding environment and would appear similar to existing conditions. Other outfall structures are located along the levee of the river: Two are located within 1.5 miles downstream of the proposed location, one is located approximately 490 feet upstream, and another outfall is located approximately 1.25 miles upstream. The new outfall along the river would not be a unique artificial feature that would be unfamiliar to boaters or recreation users that frequent the area. Thus, constructing the new outfall would not substantially degrade the existing visual character or quality of public views of the site and its surroundings.

Nighttime construction activities are not anticipated to be required for construction of the proposed project. In addition, the proposed project would not introduce any new sources of light and glare into the project site for operational use. Implementation of the proposed project would have no impact related to new sources of light and glare.

- Agriculture and Forestry Resources: Project improvements and construction staging and access would affect the existing CTF; portions of road rights-of-way along Tesla Way, Harlan Road, Inland Passage Way, farmland adjacent to Sadler Oak Drive and Queirolo Road; and the San Joaquin River and adjacent levee. Farmland of Local Importance, as defined by the California Department Conservation, is located south of Sadler Oak Drive and Tesla Way, which are adjacent to portions of the project site where pipelines would be constructed within road rights-of-way (California Department of Conservation 2020). Although the area south of Tesla Way is identified as Farmland of Local Importance by California Department of Conservation, this area contains developed urban uses and an undeveloped lot that is surrounded on all sides by other developed urban uses. This area would remain undisturbed by the proposed project.

  A small portion (approximately 0.9 acre) of the area containing Farmland of Local Importance located south of Sadler Oak Drive near the intersection with Inland Passage Way is identified as an area that could be used for construction staging for the proposed project (see Figure 2-8 in Chapter 2, "Project Description"). This area includes a portion of the levee and farmland. The proposed project's construction activities are anticipated to begin in spring 2021 and be completed by fall 2022. After completion of project construction, disturbed portions of the project site, including construction staging areas, would be returned to preproject conditions. Implementing the proposed project would not result in the permanent conversion of this area to nonagricultural uses.

  No Important Farmland, Williamson Act contract lands, forestland, or timberland exists on the project site. Therefore, implementing the proposed project would not directly remove agriculture or forestry resources. Proposed project activities would remove an impediment to planned growth because the surface water discharge would provide an alternative method of disposing of treated effluent that would otherwise require application to agricultural land. Consequently, implementing the proposed project may result in the indirect conversion of agricultural land to nonagricultural use. However, this land is designated in the Lathrop General Plan for urban development, and this impact was previously addressed in the subsequent EIR prepared for the River Islands at Lathrop Project (City of Lathrop 2003), which is incorporated herein by reference. That EIR was certified, and the City of Lathrop accepted the impacts associated with the conversion of agricultural resources to urban uses in its approval of the subject project. Implementation of this project would not result in impacts on agricultural resources not previously addressed by that document.

- Geology and Soils: The proposed project would be designed and constructed to meet California Building Code requirements to avoid potentially significant impacts related to seismic hazards and soil stability. Also, the proposed project would not involve the construction or use of septic tanks or alternative wastewater disposal systems.

  The project site is located in a relatively flat area in the City of Lathrop within the Central Valley; therefore, there would be no impact related to landslides.

Refer to Section 3.9, "Hydrology and Water Quality," which addresses the potential for the proposed project to cause erosion on- and off-site (see the "Surface Runoff" section under "Issues Not Discussed Further" in Section 3.9 and Impacts 3.9-1, 3.9-2, and 3.9-4).

- Land Use: The proposed project would involve construction of new pipelines along existing roadways, a new outfall on the San Joaquin River, and improvements at the existing CTF. Although the pipelines along Sadler Oak Drive and Inland Passage Way would be adjacent to existing residences, these pipelines would be underground and would not result in the physical division of an established community.

  Construction related to underground pipelines, an outfall on the river, and new infrastructure at the CTF would not result in any aboveground uses that would be inconsistent with the City of Lathrop General Plan or zoning ordinance. As described in Section 2.1, "Project Background and Need," and Section 2.2, "Project Objectives," the proposed project would provide the opportunity to discharge treated effluent to the San Joaquin River to support planned buildout of the City consistent with the City's General Plan. Thus, the proposed project would not conflict with City plans or policies and cause a significant environmental impact.

  The potential for the proposed project to conflict with The Delta Plan and the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan are addressed in Section 3.3, "Terrestrial Biological Resources," and Section 3.4, "Aquatic Biological Resources." As described therein, the proposed project would not conflict with either of these plans such that there would be a significant environmental impact.

- Mineral Resources: The project site is located near areas that are designated as MRZ-3, which are areas containing mineral deposits the significance of which cannot be evaluated from available data (California Geological Survey 2012). The nearest active aggregate mine is Brown Sand Incorporated, located more than 1 mile southeast of Sadler Oak Drive along Mossdale Road. The project site includes the existing CTF; portions of road rights-of-way along Tesla Way, Harlan Road, and Inland Passage Way; and the San Joaquin River and adjacent levee. It is not used for mineral extraction, nor is it designated as an important mineral recovery site. Therefore, implementing the proposed project would not have the potential to affect mineral resources.

- Population and Housing: The proposed project does not involve constructing housing and, thus, would not contribute to unplanned growth. It would include construction along existing road rights-of-way and at the existing CTF, but it would not displace people or housing. Therefore, the proposed project would have no impact on population and housing. The potential for the proposed project to have indirect growth-inducing effects is addressed in Section 6.1, "Growth Inducement," in Chapter 6, "Other CEQA Sections," of this EIR.

- Public Services: The proposed project would not generate an increased need for public services, such as fire or police protection, schools, or parks, because there would be no substantial changes in population or any new housing resulting from the changes at the CTF and installation of pipelines or the outfall on the San Joaquin River. In addition, project components would not physically alter existing government facilities such that service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks or other public facilities would be affected. Implementing the proposed project would not result in the need for new or altered governmental facilities and would, therefore, not affect public services.

- Recreation: The proposed project would not contribute to unplanned growth and would not include new housing, so it would not increase the use of existing recreational facilities or demand for new recreational facilities that would adversely affect the environment. Therefore, the proposed project would have no impact on recreation.

- Transportation: The proposed project would include construction of new pipelines along and within existing roadway rights-of-way, a new outfall on the San Joaquin River, and improvements at the existing CTF.

  Construction is the only activity that would produce vehicle miles traveled (VMT), which, according to State CEQA Guidelines Section 15064, is the metric to evaluate transportation impacts. Section 15064.3(b)(3), "Qualitative Analysis," states that if existing models or methods are not available to estimate VMT for the particular project being considered, a lead agency may analyze the project's VMT qualitatively. This section also notes that for many projects, a qualitative analysis of construction traffic may be appropriate. In addition, the Governor's Office of Planning and Research (OPR) released the Technical Advisory on Evaluating Transportation Impacts (OPR 2018) to provide advice and recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures as they relate to VMT. The technical advisory notes that projects generating or attracting fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact, absent substantial evidence indicating otherwise (OPR 2018). Therefore, as described in OPR guidance, if the project would generate fewer than 110 trips per day, it would result in a less-than-significant VMT impact.

Implementing the proposed project would not result in any changes to staffing and thus would not result in any long-term operational increases in vehicular traffic or increased demand on pedestrian or bicycle facilities. There are no existing transit facilities in the vicinity of the project site. In addition, implementation of the proposed project would not require the construction, redesign, or alteration of any public roadways. Thus, the proposed project would not conflict with a program, plan, ordinance, or policy addressing pedestrian, bicycle, or transit facilities.

Construction of the proposed project (e.g., CTF modifications, effluent pipeline) would result in short-term, temporary increases in vehicle trips, including heavy-vehicle trips to haul equipment and materials and trips associated with the workers commuting to and from the construction sites. The number of haul trips and worker trips would vary based on the phase of the construction activity. However, as detailed in the Technical Advisory on Evaluating Transportation Impacts provided by OPR, the analysis of vehicle miles traveled under Section 15064.3 refers to on-road passenger vehicles, specifically cars and light trucks. Haul trucks, trailers, cement trucks, water trucks, dump trucks, and other heavy-duty vehicles would not qualify as automobiles. Therefore, these larger on-road construction vehicles that do not fall within the categories of cars and light trucks do not need to be considered in calculations of trips or VMT. Conservatively assuming that the construction associated with the effluent pipeline, the CTF modifications, and the levee crossing and outfall structure would occur concurrently, a total of 98 daily worker commute trips would be generated during project construction. Therefore, it is anticipated that fewer than 110 passenger vehicle trips per day would be generated during the peak of construction activities. In addition, these trips would be temporary and intermittent in nature. Therefore, because the proposed project would generate fewer than 110 trips per day, it would not conflict or otherwise be inconsistent with State CEQA Guidelines Section 15064.3(b).

Construction would occur adjacent to and within public roadway rights-of-way and thus would likely require temporary lane closures along Tesla Way, Harlan Road, and Inland Passage Way. However, as described in Chapter 2, "Project Description," project construction activity occurring within road rights-of-way would require application for and approval of an Encroachment Permit from the City. As part of the Encroachment Permit application and approval process, a registered engineer or acceptable alternative would be required to prepare a traffic control plan for implementation during construction activities that may affect any of these road rights-of-way (City of Lathrop 2020a). The traffic control plan would follow Caltrans standards (i.e., Chapter 6C of Revision 5 to the 2014 Edition of the California Manual on Uniform Traffic Control Devices [Caltrans 2020b]) and would identify measures that would ensure continued access to adjacent land uses (e.g., residences, industrial) and maintain emergency access. Therefore, the proposed project would not substantially increase hazards related to a design feature or incompatible use or result in inadequate emergency access.

- **Utilities:** Implementing the proposed project would not create a demand for natural gas or telecommunications facilities. The proposed project consists of constructing infrastructure improvements that would support wastewater disposal and maximum use of recycled water in the City and in and of itself would not increase generation of wastewater and would not increase demand for recycled water. In addition, this project consists of infrastructure improvements that would not create a demand for water supply. For these reasons, the proposed project would result in no impact on demand for natural gas, water, recycled water, wastewater, or telecommunications facilities.

  Because implementing the proposed project would not generate demand for water supply, it would not result in adverse effects on water supplies during normal, dry, and multiple dry years. Because the proposed project would not generate new demand for wastewater treatment and is being developed to address wastewater treatment and disposal capacity needs for the City, it would not result in a determination by the wastewater treatment provider that it does not have adequate capacity to serve the project's wastewater demand.

The proposed project would not require expansion of existing electric power facilities. A small increase in electricity demand would be associated with operation of a new one-quarter-horsepower motor used during operation of a small pump to inject sodium bisulfite into the treated effluent to provide dechlorination in compliance with the National Pollutant Discharge Elimination System permit before discharge to the river. However, the CTF is currently connected to electricity infrastructure, and the minor increase in energy demand relative to existing conditions would not require the addition or expansion of existing electric power facilities to serve the CTF. There would be no impact related to the construction of new or expanded electricity facilities or to the associated environmental effects of such construction.

Construction of the CTF modifications would not interfere with aboveground utility lines along Tesla Way on the southwest boundary of the CTF. Because there is no utility infrastructure at the outfall (aboveground or belowground), construction of the outfall would not interfere with utility infrastructure. In addition, the proposed project would reuse the existing pipe along Sadler Oak Drive starting on the east side of I-5 all the way to the intersection with Inland Passage Way; thus, there would be no interference with underground or aboveground utilities along this road. Construction of the proposed project would include excavation and trenching in road rights-of-way along the effluent pipeline route, including on Tesla Way, Harlan Road, and Inland Passage Way and on the CTF property. Construction activities would also include excavation between Inland Passage Way and the river.

For most of the trenching activity, project construction activities would maintain minimum clearances from all utilities running parallel to the new pipelines, which should ensure that the existing utilities remain buried and are not affected by construction activity. However, at a few locations along the effluent pipeline alignment, construction activities would cross existing stormwater, wastewater, water, natural gas, electrical, and, potentially, telecommunications lines. The levee-crossing pipe would cross underground stormwater drainage infrastructure located parallel to Inland Passage Way and between the road and the levee (KPFF 2020). In addition, the pipeline along Tesla Way would cross underground stormwater drainage, electrical, and natural gas infrastructure at several locations between Murphy Parkway and Harlan Road. Telecommunications lines are likely co-located with other existing utility lines in the project site.

In each of these locations, the final plan set for the proposed project prepared by the project engineer would identify the crossing location, minimum vertical clearances, and any adjustments in the vertical alignment of the pipe to avoid the existing utility. Final plans are required to be reviewed and approved by the City before construction permits are issued by the City. The final plans shall be prepared consistent with the City of Lathrop Department of Public Works Design and Construction Standards (Design and Construction Standards, City of Lathrop 2019a), which requires that plans identify locations of all existing utilities in the project site (see Section 1-8.16 of the Design and Construction Standards). In addition, Section 1-8.16, "Existing Utilities," of the Design and Construction Standards states that the project contractor or subcontractor is required to notify Underground Service Alert 2 working days in advance of beginning any excavation work. In addition, Section 1-8.16 requires the design engineer to submit preliminary plans and final approved plans to the utility companies involved, and Section 1-8.19 requires the contractor to notify all utility companies affected by the development before beginning work. Because the proposed project would be designed to avoid conflicts with existing utility infrastructure by complying with City design and construction standards, it would not require or result in the relocation or construction of new or expanded water, recycled water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

Construction of the proposed project would result in solid waste associated with excavation materials and removal of existing pipe, which would require disposal. The proposed project would not result in an increase in biosolids that would require disposal. The change in operations at the CTF from implementation of the proposed project would not result in an increase in employment. Thus, the proposed project would not result in an increase in operations-related solid waste generation.

Current remaining capacity at the Forward Landfill (22 million cubic yards) alone or combined with the remaining capacity of one or more landfills used to a lesser extent by the City (more than 318 million cubic yards) would be sufficient to accept construction and demolition debris from the project (CalRecycle 2020a, 2020b). Furthermore, waste generated from construction of the proposed project would not represent a substantial proportion of the remaining capacity at any of these landfills. In addition, the proposed project would be required to implement a Construction and Demolition Debris Diversion Plan to divert a minimum of 65 percent of construction and demolition debris from the landfill in compliance with Section 5.408 of CCR California Green Building Standards Code, Title 24, Part 11 and the City's Construction and Demolition Recycling Program (City of Lathrop 2019b, 2020b). For these reasons, the project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. In addition, the proposed project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

- **Wildfire:** The project site is not located in or near a State Responsibility Area or lands classified as a Very High Fire Hazard Severity Zone (CAL FIRE 2020). Therefore, there would be no impact related to wildfire.

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# 3.2 AIR QUALITY

This section includes a discussion of existing air quality conditions, a summary of applicable air quality regulations, and an analysis of potential short-term and long-term air quality impacts that could result from implementation of the proposed project. The methods of analysis for short-term construction, long-term regional (operational), local mobile-source, and toxic air emissions are consistent with the San Joaquin Valley Air Pollution Control District's (SJVAPCD's) *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015a) as well as recommendations of staff at SJVAPCD and the California Air Resources Board (CARB).

In June 2013, the City of Lathrop adopted the *Consolidated Treatment Facility Project Initial Study/Mitigated Negative Declaration* (2013 CTF IS/MND), which evaluated project-level CEQA authorization for expansion of the CTF treatment capacity to 6 million gallons per day (mgd) and program-level CEQA authorization for an additional 3.1 mgd of treatment capacity, for a total capacity of 9.1 mgd at the CTF. The proposed project and its associated operational emissions are a covered action in the 2013 CTF IS/MND. As such, the analysis prepared for the 2013 CTF IS/MND is incorporated by reference where appropriate.

## 3.2.1 Regulatory Setting

Air quality in the project area is regulated through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality within the air basin are discussed below.

### FEDERAL

#### U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) has been charged with implementing national air quality programs. EPA's air quality mandates draw primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments were made by Congress in 1990. EPA's air quality efforts address both criteria air pollutants and precursors and hazardous air pollutants (HAPs). EPA regulations concerning criteria air pollutants and precursors and HAPs are presented in greater detail below.

<u>Criteria Air Pollutants</u>

The CAA required EPA to establish the national ambient air quality standards (NAAQS) (42 United States Code Section 7409). As shown in Table 3.2-1, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), respirable particulate matter with an aerodynamic diameter of 10 micrometers or less ($PM_{10}$), fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead. The primary standards protect the public health, and the secondary standards protect public welfare. The CAA also requires each state to prepare a State Implementation Plan (SIP) for attaining and maintaining the NAAQS. The CAA Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. Individual SIPs are modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basin.

**Table 3.2-1 National and California Ambient Air Quality Standards**

| Pollutant | Averaging Time | California (CAAQS)[1,2] | National (NAAQS)[3] | |
|---|---|---|---|---|
| | | | Primary[2,4] | Secondary[2,5] |
| Ozone | 1-hour | 0.09 ppm (180 μg/m³) | – | Same as primary standard |
| | 8-hour | 0.070 ppm (137 μg/m³) | 0.070 ppm (147 μg/m³) | |
| Carbon monoxide (CO) | 1-hour | 20 ppm (23 mg/m³) | 35 ppm (40 mg/m³) | Same as primary standard |
| | 8-hour | 9 ppm[6] (10 mg/m³) | 9 ppm (10 mg/m³) | |
| Nitrogen dioxide ($NO_2$) | Annual arithmetic mean | 0.030 ppm (57 μg/m³) | 53 ppb (100 μg/m³) | Same as primary standard |
| | 1-hour | 0.18 ppm (339 μg/m³) | 100 ppb (188 μg/m³) | — |
| Sulfur dioxide ($SO_2$) | 24-hour | 0.04 ppm (105 μg/m³) | — | — |
| | 3-hour | — | — | 0.5 ppm (1,300 μg/m³) |
| | 1-hour | 0.25 ppm (655 μg/m³) | 75 ppb (196 μg/m³) | — |
| Respirable particulate matter ($PM_{10}$) | Annual arithmetic mean | 20 μg/m³ | — | Same as primary standard |
| | 24-hour | 50 μg/m³ | 150 μg/m³ | |
| Fine particulate matter ($PM_{2.5}$) | Annual arithmetic mean | 12 μg/m³ | 12.0 μg/m³ | 15.0 μg/m³ |
| | 24-hour | — | 35 μg/m³ | Same as primary standard |
| Lead [6] | Calendar quarter | — | 1.5 μg/m³ | Same as primary standard |
| | 30-Day average | 1.5 μg/m³ | — | — |
| | Rolling 3-Month Average | – | 0.15 μg/m³ | Same as primary standard |
| Hydrogen sulfide | 1-hour | 0.03 ppm (42 μg/m³) | No national standards | |
| Sulfates | 24-hour | 25 μg/m³ | | |
| Vinyl chloride [6] | 24-hour | 0.01 ppm (26 μg/m³) | | |
| Visibility-reducing particulate matter | 8-hour | Extinction of 0.23 per km | | |

1 California standards for ozone, carbon monoxide, $SO_2$ (1- and 24-hour), $NO_2$, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

3 National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. The $PM_{10}$ 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than one. The $PM_{2.5}$ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

4 National primary standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

5 National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

6 The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. This allows for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Notes: μg/m³ = micrograms per cubic meter; km = kilometers; mg/m³ = milligrams per cubic meter; ppb = parts per billion; ppm = parts per million.

Sources: EPA 2016; CARB 2016

### Hazardous Air Pollutants and Toxic Air Contaminants

Toxic air contaminants (TACs), or in federal parlance, HAPs, are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

A wide range of sources, from industrial plants to motor vehicles, emit TACs. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage; or short-term acute effects, such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches.

For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. This contrasts with criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 3.2-1). Cancer risk from TACs is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure.

EPA and CARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum available control technology or best available control technology for air toxics to limit emissions.

# STATE

## California Air Resources Board

CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required CARB to establish California ambient air quality standards (CAAQS) (Table 3.2-1).

### Criteria Air Pollutants

CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to attain and maintain the CAAQS by the earliest date practical. The CCAA specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources. The CCAA also provides air districts with the authority to regulate indirect emission sources.

### Toxic Air Contaminants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (Hot Spots Act) (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, particulate matter (PM) exhaust from diesel engines (diesel PM) was added to CARB's list of TACs.

After a TAC is identified, CARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate best available control technology for toxics to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

AB 617 of 2017 aims to help protect air quality and public health in communities around industries subject to the State's cap-and-trade program for greenhouse gas emissions. AB 617 imposes a new state-mandated local program to address non-vehicular sources (e.g., refineries, manufacturing facilities) of criteria air pollutants and TACs. The bill requires CARB to identify high-pollution areas and directs air districts to focus air quality improvement efforts through adoption of community emission reduction programs within these identified areas. Currently, air districts review individual sources and impose emissions limits on emitters based on best available control technology, pollutant type, and proximity to nearby existing land uses. This bill addresses the cumulative and additive nature of air pollutant health effects by requiring community-wide air quality assessment and emission reduction planning.

CARB has adopted diesel exhaust control measures and more stringent emissions standards for various transportation-related mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan and other regulatory programs, it is estimated that emissions of diesel PM will be less than half of those in 2010 by 2035 (CARB 2020a). Adopted regulations are also expected to continue to reduce formaldehyde emissions emitted by cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

#### Ultrafine Particulate Matter

Ultrafine particulate matter (UFP) refers to a subfraction of currently regulated $PM_{10}$ and $PM_{2.5}$ particles. UFP is most often defined as particles with an aerodynamic diameter of 0.1 micron or smaller (Health Effects Institute 2013:1; CARB 2020b; Kleeman et al. 2007:1). Recent studies have raised concerns that exposure to UFP may lead to adverse health effects in animals and humans (Health Effects Institute 2013:2; Froines 2006) and that UFP may be more toxic than larger sized particles (Zhu et al. 2002:4324; Li et al. 2003:455). To date, no federal agencies, including EPA, have established standards, policies, or guidance regarding concentration of UFP; however, UFPs may include TACs, for which there are federal standards, as discussed above.

## LOCAL

### San Joaquin Valley Air Pollution Control District

#### Criteria Air Pollutants

SJVAPCD is the primary agency responsible for planning to meet the NAAQS and CAAQS in the San Joaquin Valley Air Basin (SJVAB), in which the project site is located. SJVAPCD works with CARB and EPA to maintain the region's portion of the SIP for ozone and $PM_{2.5}$. The SIP is a compilation of plans and regulations that govern how the region and state will comply with the federal CAA requirements to attain and maintain the NAAQS for ozone and $PM_{2.5}$. The SJVAB has been designated as nonattainment with respect to the NAAQS and CAAQS for ozone and $PM_{2.5}$ (Table 3.2-2) (SJVAPCD 2015a).

SJVAPCD also enforces air quality regulations, educates the public about air quality, and implements a number of programs to provide incentives for the replacement or retrofit of older diesel engines and to influence land use development in the SJVAB.

**Table 3.2-2 Sources and Health Effects of Criteria Air Pollutants**

| Pollutant | Sources | Acute[1] Health Effects | Chronic[2] Health Effects |
|---|---|---|---|
| Ozone | Secondary pollutant resulting from reaction of ROG and $NO_X$ in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; $NO_X$ results from the combustion of fuels | Increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation | Permeability of respiratory epithelia, possibility of permanent lung impairment |
| Carbon monoxide (CO) | Incomplete combustion of fuels; motor vehicle exhaust | Headache, dizziness, fatigue, nausea, vomiting, death | Permanent heart and brain damage |
| Nitrogen dioxide ($NO_2$) | Combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines | Coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cyanosis, chest pain, rapid heartbeat, death | Chronic bronchitis, decreased lung function |
| Sulfur dioxide ($SO_2$) | Coal and oil combustion, steel mills, refineries, and pulp and paper mills | Irritation of upper respiratory tract, increased asthma symptoms | Insufficient evidence linking $SO_2$ exposure to chronic health impacts |
| Respirable particulate matter ($PM_{10}$), Fine particulate matter ($PM_{2.5}$) | Fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of $SO_2$ and ROG | Breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death | Alterations to the immune system, carcinogenesis |
| Lead | Metal processing | Reproductive/ developmental effects (fetuses and children) | Numerous effects including neurological, endocrine, and cardiovascular effects |

1 Acute health effects refer to immediate illnesses caused by short-term exposures to criteria air pollutants at fairly high concentrations. An example of an acute health effect includes fatality resulting from short-term exposure to carbon monoxide levels in excess of 1,200 parts per million.

2 Chronic health effects refer to cumulative effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations. An example of a chronic health effect includes the development of cancer from prolonged exposure to particulate matter at concentrations above the national ambient air quality standards.

Notes: $NO_X$ = oxides of nitrogen; ROG = reactive organic gases.

Source: EPA 2018

All projects are subject to adopted SJVAPCD rules and regulations in effect at the time of construction. Specific rules applicable to the proposed project may include but are not limited to the following:

- **Regulation VIII—Fugitive Dust $PM_{10}$ Prohibitions:** Rules 8011–8081 are designed to reduce $PM_{10}$ emissions (predominantly dust and dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track out, and landfill operations. Compliance with Regulation VIII is mandatory, so compliance by the project proponent is assumed in this analysis.
- **Rule 2010—Permits Required:** This rule applies to anyone who plans to or does operate, construct, alter, or replace any source operation that may emit air contaminants or may reduce the emission of air contaminants. The proposed project would be subject to SJVAPCD permitting requirements for stationary sources such as boilers or back-up generators.
- **Rule 3135—Dust Control Plan Fee:** This rule requires applicants to submit a fee in addition to a dust control plan. The purpose of this fee is to recover SJVAPCD's cost for reviewing such plans and conducting compliance inspections.
- **Rule 4002—National Emissions Standards for Hazardous Air Pollutants**: This rule applies to all sources of HAPs and requires them to comply with the standards, criteria, and requirements set forth therein.

- **Rule 4101—Visible Emissions:** This rule prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air contaminants.
- **Rule 4102—Nuisance:** This rule applies to any source operation that emits or may emit air contaminants or other materials. If such emissions create a public nuisance, the owner/operator could be in violation and be subject to enforcement action by SJVAPCD.
- **Rule 4601—Architectural Coatings:** This rule limits volatile organic compounds from architectural coatings by specifying storage, cleanup, and labeling requirements for architectural coatings.

In addition, if modeled construction- or operation-related emissions for a project exceed SJVAPCD's mass emission thresholds for criteria air pollutants and precursors then SJVAPCD recommends implementing mitigation to reduce these emissions. As a form of mitigation, a project proponent may enter into a Voluntary Emission Reduction Agreement with SJVAPCD to reduce the project-related impact on air quality to a less-than-significant level. A Voluntary Emission Reduction Agreement is a mitigation measure by which the project proponent provides pound-for-pound mitigation of emissions increases through a process that funds and implements emission reduction projects (SJVAPCD 2015a). SJVAPCD's mass emission thresholds are presented in Section 3.2.3, "Environmental Impacts and Mitigation Measures."

#### Toxic Air Contaminants

At the local level, air districts may adopt and enforce CARB control measures. Under SJVAPCD Rule 2010 ("Permits Required"), Rule 2201 ("New and Modified Stationary Source Review"), and Rule 2550 ("Federally Mandated Preconstruction Review for Major Sources of Air Toxics"), all sources that possess the potential to emit TACs are required to obtain permits from SJVAPCD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including New Source Review standards and air toxics control measures. SJVAPCD limits emissions and public exposure to TACs through multiple programs. SJVAPCD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. Sensitive receptors are people, or facilities that generally house people (e.g., residences, schools, hospitals), that may experience adverse effects from unhealthful concentrations of air pollutants.

#### Odors

Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable stress among the public and often generating citizen complaints to local governments and SJVAPCD. SJVAPCD Rule 4102 ("Nuisance") regulates odorous emissions.

### City of Lathrop General Plan

The City of Lathrop General Plan (General Plan) includes several policies specifically related to air quality. The following policies from the "Air Quality and Solid Waste Management Policies" section of the General Plan apply to the proposed project:

- **Policy 3:** The City shall adopt standards which require industrial process analysis before the fact of site and building permit approval to assure compliance with State air quality and water quality standards. Standards shall provide for periodic monitoring of industrial processes which could have an adverse impact on water or air quality. Industrial process review that may be required should be conducted as part of environmental assessment by an engineer licensed in California having demonstrated experience in the industrial process involved.
- **Policy 4:** The City shall require positive control of dust particles during project construction activities, including watering or use of emulsions, parking of heavy equipment on paved surfaces, prohibition of land grading operation during days of high wind (beginning at 10 mph, with gusts exceeding 20 mph), and prohibitions of burning on vacant parcels. The City should seek the cooperation of agricultural operators to refrain from the plowing of fields on windy days, and to keep loose soils under control to the extent reasonable to avoid heavy wind erosion of soils.

## 3.2.2 Environmental Setting

The project site is located in the City of Lathrop, which is within the SJVAB. The SJVAB includes all of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare Counties and the valley portion of Kern County. Ambient concentrations of air pollutants are determined by the levels of emissions released by pollutant sources and the ability of the atmosphere to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight.

## CLIMATE, METEOROLOGY, AND TOPOGRAPHY

The SJVAB is the southern half of California's Central Valley and is approximately 250 miles long and averages 35 miles wide. The SJVAB is bordered by the Sierra Nevada in the east, the Coast Ranges in the west, and the Tehachapi mountains in the south. There is a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the valley opens to the San Francisco Bay at the Carquinez Straits. At its northern end is the Sacramento Valley, which comprises the northern half of California's Central Valley. The bowl-shaped topography inhibits movement of pollutants out of the SJVAB.

The SJVAB is in a Mediterranean Climate Zone and is influenced by a subtropical high-pressure cell most of the year. Rainfall is sparse, which occurs mainly in winter. Summers are hot and dry. Summertime maximum temperatures often exceed 100 degrees Fahrenheit (°F).

The subtropical high-pressure cell is strongest during spring, summer and fall and produces subsiding air, which can result in temperature inversions in the SJVAB. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass at the surface. Any emissions of pollutants can be trapped below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500–3,000 feet).

Winter-time high pressure events can often last many weeks with surface temperatures often lowering to 30–40°F. During these events, fog can be present, and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutants to a few hundred feet.

Solar radiation and temperature are particularly important in the chemistry of ozone formation. The SJVAB averages over 260 sunny days per year. Photochemical air pollution (primarily ozone) is produced by the atmospheric reaction of organic substances (such as volatile organic compounds) and oxides of nitrogen ($NO_X$) under the influence of sunlight (SJVAPCD 2015a).

The local meteorology of the project site and surrounding area is represented by measurements recorded at the Western Regional Climate Center Tracy Pumping Plant Station. The average annual precipitation from a 1995 to 2016 period is approximately 12 inches. Average January temperatures range from a normal minimum of 38°F to a normal maximum of 55°F. July temperatures range from a normal minimum of 61°F to a normal maximum of 93°F (WRCC 2016). The prevailing wind direction is from the west (WRCC 2002).

## CRITERIA AIR POLLUTANTS

Concentrations of emissions from criteria air pollutants are used to indicate the quality of the ambient air (Table 3.2-3). A brief description of key criteria air pollutants in the SJVAB is provided below.

### Ozone

Ozone is a photochemical oxidant (a substance whose oxygen combines chemically with another substance in the presence of sunlight) and the primary component of smog. Ozone is not directly emitted into the air but is formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and $NO_X$ in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. $NO_X$ are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Acute health effects of ozone exposure include increased respiratory and pulmonary resistance, cough, pain, shortness of breath, and lung inflammation. Chronic health effects include permeability of respiratory epithelia and possibility of permanent lung impairment (EPA 2018). Emissions of the ozone precursors ROG and $NO_X$ have decreased over the past two decades because of more stringent motor vehicle standards and cleaner burning fuels and are projected to continue decreasing from 2010 to 2035 (CARB 2013).

**Table 3.2-3 Attainment Status Designations for San Joaquin County**

| Pollutant | National Ambient Air Quality Standard | California Ambient Air Quality Standard |
|---|---|---|
| Ozone | — | Nonattainment (1-hour) Classification-Serious[1] |
| | Nonattainment (8-hour)[2] Classification=Extreme | Nonattainment (8-hour) |
| Respirable particulate matter ($PM_{10}$) | Attainment (24-hour) | Nonattainment (24-hour) |
| | — | Nonattainment (Annual) |
| Fine particulate matter ($PM_{2.5}$) | Nonattainment (24-hour) | — |
| | Nonattainment (Annual) | Nonattainment (Annual) |
| Carbon monoxide (CO) | Unclassified/Attainment (1-hour) | Attainment (1-hour) |
| | Unclassified/Attainment (8-hour) | Attainment (8-hour) |
| Nitrogen dioxide ($NO_2$) | Unclassified/Attainment (1-hour) | Attainment (1-hour) |
| | Unclassified/Attainment (Annual) | Attainment (Annual) |
| Sulfur dioxide ($SO_2$) | Unclassified/Attainment (1-Hour) | Attainment (1-hour) |
| | | Attainment (24-hour) |
| Lead (particulate) | Unclassified/Attainment (3-month rolling avg.) | Attainment (30-day average) |
| Hydrogen sulfide | No Federal Standard | Unclassified (1-hour) |
| Sulfates | | Attainment (24-hour) |
| Visibility-reducing particles | | Unclassified (8-hour) |
| Vinyl chloride | | Unclassified (24-hour) |

1 Per Health and Safety Code Section 40921.5(c), the classification is based on 1989–1991 data and therefore does not change.

2 2015 Standard.

Sources: CARB 2018; EPA 2020

## Nitrogen Dioxide

$NO_2$ is a brownish, highly reactive gas that is most present in urban environments. The major human-made sources of $NO_2$ are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit, primarily, nitric oxide (NO), which reacts through oxidation in the atmosphere to form $NO_2$. The combined emissions of NO and $NO_2$ are referred to as $NO_X$ and are reported as equivalent $NO_2$. Because $NO_2$ is formed and depleted by reactions associated with photochemical smog (ozone), the $NO_2$ concentration in a particular geographical area may not be representative of the local sources of $NO_X$ emissions (EPA 2018).

Acute health effects of exposure to $NO_X$ includes coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis, or pulmonary edema, breathing abnormalities, cyanosis, chest pain, rapid heartbeat, and death. Chronic health effects include chronic bronchitis and decreased lung function (EPA 2018).

## Particulate Matter

Respirable particulate matter ($PM_{10}$) consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by reaction of gaseous precursors (CARB 2013:1-20). Respirable particulate matter includes a subgroup of smaller particles, fine particulate matter ($PM_{2.5}$). $PM_{10}$ emissions in the SJVAB are dominated by emissions from area sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from residential fuel combustion. Emissions of $PM_{2.5}$ in the SJVAB are dominated by the same sources as emissions of $PM_{10}$ (CARB 2013:4-27).

A number of adverse health impacts have been associated with exposure to both $PM_{2.5}$ and $PM_{10}$ (EPA 2018). Short-term exposures to $PM_{10}$ have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits. For $PM_{2.5}$, short-term exposures (up to 24 hours in duration) have been associated with premature mortality, increased hospital admissions for heart or lung cases, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases. In addition, of all of the common air pollutants, $PM_{2.5}$ is associated with the greatest proportion of adverse health effects related to air pollution, both in the United States and world-wide. Long-term (months to years) exposure to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children.

## TOXIC AIR CONTAMINANTS

According to the 2013 Edition of the California Almanac of Emissions and Air Quality, health risks from TACs can largely be attributed to relatively few compounds, the most important being diesel PM (CARB 2013). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, CARB has made preliminary concentration estimates based on a PM exposure method. This method uses the CARB emissions inventory's $PM_{10}$ database, ambient $PM_{10}$ monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Overall, levels of most TACs, except para-dichlorobenzene and formaldehyde, have decreased since 1990 (CARB 2013).

## ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals can smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity. Odor sources of concern include wastewater treatment plants, sanitary landfills, composting facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting operations, rendering plants, food packaging plants, and cannabis (OPR 2017). The project site includes the CTF, which is a source of odor as a wastewater treatment facility; however, odors from the existing CTF are treated using an airborne atomizer system that applies to the facility's sludge-drying areas. The remainder of the plant does not require additional odor control measures.

## SENSITIVE RECEPTORS

Sensitive receptors are generally considered to include those land uses where exposure to pollutants could result in health-related risks to sensitive individuals, such as children or the elderly. Residential dwellings, schools, hospitals, playgrounds, and similar facilities are of primary concern because of the presence of individuals particularly sensitive to pollutants and/or the potential for increased and prolonged exposure of individuals to pollutants. The existing CTF location exists within an industrial area and does not include any sensitive receptors. Suburban single-family homes along the north side of Sadler Oak Drive and east side of Inland Passage Way are located approximately 60 feet from the closest edge of the proposed effluent discharge pipeline. Additionally, suburban single-family homes along Inland Passage Way directly north of the intersection of Emory Oak Place and Inland Passage Way are located approximately 90 feet from the closest edge of the proposed pipe levee crossing and approximately 295 feet from the bank of the San Joaquin River, where the new outfall would be constructed.

# 3.2.3 Environmental Impacts and Mitigation Measures

## ANALYSIS METHODOLOGY

Short-term construction-related emissions were modeled using the construction module of the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 (CAPCOA 2017). Construction equipment, hours of use per day, and number of days used were provided by the project applicant. In addition, total quantities of material hauled and imported were provided as well as projections of daily trips for construction workers and material hauling. Construction of the proposed project was assumed to begin in July 2021 and be completed by November 2022. Annual emissions were estimated for 2021 and 2022 and accounts for overlapping of various phases, including construction of the pipeline, CTF, and levee crossing and outfall between April and December of 2021, and decommissioning of Ponds A, B, and C in 2022.

Maximum daily emissions characterize a worst-case scenario assuming that construction phasing and equipment operation would overlap at three of the project's component sites (i.e., CTF, effluent discharge pipeline, and levee crossing and outfall). Maximum daily emissions were evaluated under two scenarios. Scenario 1 assumes that construction of the effluent discharge pipeline would be implemented by two pipeline crews; Scenario 2 assumes that the effluent discharge pipeline would be constructed by one crew.

Operational, indirect emissions associated with electricity consumption from the proposed project were not estimated because energy demand would essentially be the same as the demand associated with the existing CTF and recycled water system operations. Although expansion of the CTF to 6.0 mgd could require additional employees and energy demand to treat a greater volume of effluent, which requires more pumping and treatment, resulting in emissions of criteria air pollutants and ozone precursors, these emissions were previously evaluated in the 2013 CTF IS/MND and are incorporated by reference.

Since the preparation of the 2013 CTP IS/MND, the California Supreme Court issued a ruling in *Sierra Club v. County of Fresno (2018)* 6 Cal.5th 502 regarding an air quality analysis prepared for the Friant Ranch Development Project EIR in December 2018. The Court asserted that the air quality analysis performed for the project did not adequately explain the nature and magnitude of long-term air quality impacts from emissions of criteria pollutants and ozone precursors. The Court held that the EIR lacked "sufficient detail to enable those who did not participate in its preparation to understand and consider meaningfully the issues the proposed project raises."

The Court expressed the need to determine whether there was a connection between the significant project emissions and the human health impacts associated with such emissions. According to the Court, one pathway would be to estimate the level of ozone that would be produced from the project, measure to what extent human health would be affected, and describe where daily exceedances of the NAAQS and CAAQS would occur in an air basin. This detailed approach to modeling is founded on the assumption that such an exercise would produce estimates of meaningful accuracy.

In response to this recent decision, this EIR includes a discussion of the development of air quality thresholds of significance for criteria pollutants and ozone precursors and their connection to attainment of the NAAQS and CAAQS, as well as a discussion of the applicability of regional air pollution modeling.

Typically, air districts develop thresholds of significance for CEQA evaluation (summarized below) in consideration of maintaining or achieving attainment under the NAAQS and CAAQS for the geographical area they oversee (long-term regional air quality planning). Typically, these thresholds are tied to an air district in nonattainment's SIP for criteria air pollutants within a cumulative context. These SIPs are submitted to CARB and contain an inventory of existing ambient air pollutant concentrations and, if applicable, a suite of measures to reduce air pollution and a projected date of achieving attainment under the NAAQS and CAAQS. Air quality plans identify a budget that accounts for new, future sources of pollution from land use development and stationary sources. These budgets inform the development of CEQA thresholds of significance and represent an allowable level of pollution that, when emitted in volumes below such thresholds, would not conflict with an air district's long-term regional air quality planning or attainment date.

As discussed previously, the NAAQS and CAAQS represent concentrations of criteria air pollutants protective of human health and are substantiated by extensive scientific evidence. EPA and CARB recognize that ambient air quality below these concentrations would not cause adverse health impacts to exposed receptors. In connecting an air district's (e.g., SJVAPCD) thresholds of significance to its anticipated date of attainment, projects that demonstrate levels of construction and/or operational emissions below the applicable thresholds would be consistent with long-term regional planning efforts. Such projects would not result in emissions that would conflict with an area achieving future attainment status under the NAAQS and CAAQS as outlined by an applicable air quality plan.

Similarly, projects that demonstrate emissions levels in exceedance of an applicable threshold could contribute to the continued nonattainment designation of a region or potentially degrade a region from attainment to nonattainment resulting in acute or chronic respiratory and cardiovascular illness associated with exposure to concentrations of criteria air pollutants above what EPA and CARB consider safe. Symptoms can include coughing, difficulty breathing, chest pain, eye and throat irritation and, in extreme cases, death caused by exacerbation of existing respiratory and cardiovascular disease, cancer, and impaired immune and lung function.

However, the exact location and magnitude of specific health impacts that could occur as a result of project-level construction or operation is infeasible to model with any degree of accuracy. While dispersion modeling of project-generated PM may be conducted to evaluate resulting ground-level concentrations, the secondary formation of PM is similar to the complexity of ozone formation, and localized impacts of directly emitted PM do not always equate to local PM concentrations due to the transport of emissions. Ozone is a secondary pollutant formed from the oxidation of ROG and $NO_X$ in the presence of sunlight. Rates of ozone formation are a function of a variety of complex physical factors, including topography, building influences on air flow (e.g., downwash), ROG and $NO_X$ concentration ratios, multiple meteorological conditions, and sunlight exposure (Seinfeld and Pandis 1996:298). For example, rates of ozone formation are highest in elevated temperatures and when the ratio of ROG to $NO_X$ is 5.5:1. When temperatures are lower and this ratio shifts, rates of ozone formation are stunted (Seinfeld and Pandis 1996:299–300). In addition, ROG emissions are composed of many compounds that have different levels of reactivity leading to ozone formation. Methane, for instance, is the most common ROG compound, yet it has one of the lowest reactivity potentials (Seinfeld and Pandis 1996:309, 312). Moreover, some groups may develop more severe health impacts than others. For instance, infants, children, the elderly, and individuals with preexisting medical conditions are more susceptible to developing illnesses from exposure to air pollutants.

Notably, during the litigation process in the Friant Ranch case, SJVAPCD submitted an *amicus curiae* brief that provided scientific context and expert opinion regarding the feasibility of performing regional dispersion modeling for ozone. In the brief, SJVAPCD states that "CEQA does not require an EIR to correlate a project's air quality emissions to specific health impacts, because such an analysis is not reasonably feasible." SJVAPCD reiterates that (SJVAPCD 2015b):

> the Air District has based its thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the [SJVAB] can accommodate without affecting the attainment date for the

> NAAQS. The Air District has tied its CEQA significance thresholds to the level at which stationary pollution sources must "offset" their emissions.... Thus the CEQA air quality analysis for criteria air pollutants is not really a localized, project-level impact analysis but one of regional "cumulative impacts."

The brief explains that these CEQA thresholds of significance are not intended to be applied such that any localized human health impact associated with a project's emissions could be identified. Rather, CEQA thresholds of significance are used to determine whether a project's emissions would obstruct a region's capability of attaining the NAAQS and CAAQS according to the emissions inventory prepared in a SIP, which is then submitted and reviewed by CARB and EPA. This sentiment is corroborated in an additional brief submitted by the South Coast Air Quality Management District (SCAQMD 2015).

SJVAPCD has not developed a dispersion model for project-level evaluation of resulting concentrations of ozone precursors within the SJVAB such that the emissions can be linked to changes in health of individuals. It is foreseeable that such a model could be developed to assess a project's contribution to the nonattainment of an air basin; however, at the time of writing this Draft EIR, SJVAPCD has not developed a model nor endorsed an existing model.

As discussed below under the heading "Thresholds of Significance," SJVAPCD has established annual thresholds of significance and daily mass emissions screening criteria for project-level emissions. Annual thresholds of significance are tied to long-term regional air quality planning while the daily mass emissions screening criteria are used as a trigger point for additional air dispersion modeling. Projects that exceed these criteria are encouraged by the district to prepare an ambient air quality analysis to determine whether a project's emissions would result in a violation of an ambient air quality standard (AAQS) within the SJVAB. However, an ambient air quality analysis is not intended to be used to quantify or predict specific human health impacts. For instance, the degree or severity of an adverse health outcome is not determined solely based on exposure to a certain concentration of a criteria air pollutant as other factors such as age, genetics, preexisting conditions, proximity to existing sources of pollution, and exposure period would also contribute to an individual's susceptibility to be adversely impacted by air pollution. This information is private and not available to a lead agency and thus cannot be included in a model to qualitatively predict future health impacts in the context of exposure to concentrations of air pollution that exceed an AAQS.

As discussed above, the NAAQS and CAAQS however, were developed in consideration of ample scientific research indicating that human health impacts may occur from exposure to certain concentrations of criteria air pollutants; therefore, a correlation between a violation of an AAQS and adverse health impacts can be made if a specific exceedance can be identified. Thus, for the reasons stated above, human health impacts are evaluated qualitatively rather than quantitatively due to inherent uncertainty pertaining to a particular individual's vulnerability to air pollution.

## THRESHOLDS OF SIGNIFICANCE

In its March 2015 *Guide for Assessing and Mitigating Air Quality Impacts* (CEQA Guide), SJVAPCD provides evidence to support the development and applicability of its thresholds of significance for project-generated emissions of criteria air pollutants and precursors, which may be used at the discretion of a lead agency overseeing the environmental review of projects located within the SJVAB. As stated in the CEQA Guide, "a Lead Agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the Lead Agency to adopt such thresholds is supported by substantial evidence" (SJVAPCD 2015a:63–64). CEQA-related air quality thresholds of significance are tied to long-term air quality planning, which focuses on achieving or maintaining attainment designations with respect to the NAAQS and CAAQS for criteria air pollutants, which are scientifically substantiated, numerical concentrations considered to be protective of human health.

These numerical thresholds for construction- and operation-related emissions of criteria air pollutants and precursors that would determine whether a project's discrete emissions would result in a regional contribution (i.e., significant) to the baseline nonattainment status of SJVAPCD. In developing thresholds of significance for individual project emissions, SJVAPCD analyzed emissions values against the SJVAPCD's offset thresholds to ozone precursors, which, when applied, prevent further deterioration of ambient air quality in the SJVAB. Thresholds for $PM_{10}$ and $PM_{2.5}$ were adapted from the SJVAPCD's $PM_{10}$ New Source Review offset thresholds for stationary sources which represent the greatest component of SJVACPD's long-term regional air quality planning (SJVAPCD 2015a:82). Using these parameters, SJVAPCD developed quantitative thresholds of significance for project-level CEQA evaluation that lead agencies may use to determine the extent to which a project's emissions of criteria air pollutants and precursors would contribute to the regional degradation of ambient air quality within the SJVAB. According to SJVACPD, projects with emissions below these thresholds of significance would demonstrate consistency with SJVAPCD's air quality plans. Notably, annual mass emissions thresholds of significance are not designed to determine whether a project's contribution of emissions would directly result in a violation of the NAAQS or CAAQS, which are hourly, concentration-based standards.

SJVACPD has also developed daily mass emissions screening criteria for ROG, $NO_X$, CO, oxides of sulfur ($SO_X$), $PM_{10}$, and $PM_{2.5}$ to determine whether project emissions would result in a violation of an AAQS. Unlike SJVACPD's annual mass emissions thresholds, which are used to evaluate a project's consistency with long-term regional air quality planning, these daily mass emissions screening criteria serve to determine the location of where an exceedance of an AAQS, and resulting adverse health impacts, could occur. Because the NAAQS and CAAQS are concentration-based standards presented hourly, daily mass emissions are a more suitable estimate to determine whether a project would contribute to a violation of an AAQS. Projects that emit emissions below these mass daily screening criteria would likely not generate emissions in levels that would result in a violation of an AAQS, and air dispersion modeling would not be required. Consequently, projects that emit emissions above these criteria are recommended to perform an AAQS to evaluate whether an exceedance, and resulting health impact, would occur. Using federal and state guidance pertaining to TACs, in addition to the findings of several scientific studies, SJVAPCD developed cancer risk and non-cancer health hazard thresholds for TAC exposure. Unlike criteria air pollutants, there is no known safe concentration of TACs in regard to cancer risk. Moreover, TAC emissions contribute to the deterioration of localized air quality and due to the dispersion characteristics of TACs, emissions generally do not cause regional-scale air quality impacts. SJVAPCD's thresholds are designed to ensure that a source of TACs does not contribute to a localized, significant impact to existing or new receptors.

As such, for the purpose of this project, this analysis uses the following thresholds of significance to determine if project-generated emissions would produce a significant localized and/or regional air quality impact such that human health would be adversely affected. Based on Appendix G of the State CEQA Guidelines and SJVAPCD recommendations, the project would result in a potentially significant impact to air quality if it would (SJVAPCD 2015a:80):

- result in emissions of criteria air pollutants or precursors that would conflict with or obstruct air quality planning efforts, result in a cumulatively considerable net increase of any criteria air pollutant for which the SJVAB has been designated as nonattainment with respect to the applicable NAAQS or CAAQS, or expose sensitive receptors to substantial pollutant concentrations. SJVAPCD considers these criteria to be exceeded if a project's construction- or operation-related emissions would exceed its annual thresholds of 10 tons per year (tpy) for ROG or $NO_X$, 100 tpy or CO, 27 tpy for $SO_X$, and/or 15 tpy for $PM_{10}$ or $PM_{2.5}$ (SJVAPCD 2015a:80). In addition, if emissions of any of these pollutants would exceed a screening criterion of 100 pounds per day (lb/day), SJVAPCD requires site-specific analysis, the ambient air quality analysis, to determine whether the project would result in a localized exceedance or cumulatively considerable contribution to an exceedance of a NAAQS or CAAQS (SJVAPCD 2015a:93–94); and/or
- expose sensitive receptors to a substantial incremental increase in TAC emissions that exceed 20 in one million for carcinogenic risk (i.e., the risk of contracting cancer) and/or a noncarcinogenic hazard index of 1.0 or greater (SJVAPCD 2015b:1).

SJVAPCD has established a tiered approach in determining the significance of operational criteria air pollution based on project type and size. In the interest of streamlining CEQA requirements, projects that fit certain descriptions and project sizes would be deemed to have a less-than-significant impact on air quality. Based on this guidance, the project, which is an industrial land use, would not have a significant operational impact on air quality if:

- industrial land uses would generate fewer than 1,506 trips per day; and
- result in less than 510,000 square feet of ground disturbance.

The proposed project would generate few, if any, trips, and certainly not the threshold of 1,506 trips per day and is under the project size threshold of 510,000 square feet; therefore, based on SJVACPD guidance, operational emissions of criteria air pollutants do not need to be quantified.

Regarding the threshold of significance for odors, the SJVAPCD CEQA Guide provides guidance to lead agencies for determining potential impacts related to odors (SJVAPCD 2015a). The CEQA Guide includes a screening table for potential odor sources that includes distances between various types of odor-generating facilities and sensitive receptors. The Guide also includes specific complaint-based thresholds for lead agencies to consider when locating new sensitive receptors near an existing odor source. However, because this project does not involve development of a new odor source, but involves modifications to an existing facility, neither of these can be appropriately applied as thresholds of significance to evaluate this project's odor impacts. The CEQA Guide states that any project with the potential to frequently expose members of the public to objectionable odors should be deemed to have a significant impact (SJVAPCD 2015a:125). This is mostly consistent with the odor question in CEQA Appendix G, which was revised as part of the 2019 update: "result in other emissions (such as those leading to odors) adversely affecting a substantial number of people." However, whereas the SJVAPCD CEQA Guide focuses on frequency of odor exposure, Appendix G focuses on number of people affected. In order to remain consistent with the 2019 CEQA Guidelines update, the threshold of significance used in this analysis is based on CEQA Appendix G:

- result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

## ISSUES NOT DISCUSSED FURTHER

### Carbon Monoxide Emissions

The proposed project would not introduce any new operational vehicle trips beyond current conditions. Therefore, mobile-source CO impacts would not occur. Therefore, the project's potential to introduce CO emissions that could cause adverse health impacts due to an exceedance of the NAAQS or NAAQS is not discussed further in this EIR.

### Odors

The CTF is equipped with an airborne atomizer system that is applied to sludge drying areas; however, the remainder of the plant does not produce odors such that additional odor control measures are required. The project would introduce a new dechlorination process, which does not produce adverse odors. Therefore, odor-related impacts are not discussed further.

## IMPACT ANALYSIS

### Impact 3.2-1: Result in Short-Term Emissions of Criteria Air Pollutants and Precursors

The proposed project would result in construction-related emissions of ROG, $NO_X$, CO, $SO_X$, $PM_{10}$, and $PM_{2.5}$ from use of off-road heavy-duty construction equipment. Project-generated construction emissions of criteria air pollutants would not exceed any SJVAPCD mass emissions thresholds. Consistent with SJVAPCD Regulation VIII (Fugitive $PM_{10}$ Prohibition), measures would be implemented to reduce construction-related $PM_{10}$ emissions (predominantly dust and dirt). Nonetheless, the proposed project would generate emissions in excess of SJVAPCD's daily mass emissions screening criteria, thus, this impact would be **potentially significant**.

Project-generated construction activity would result in emissions of ROG, $SO_X$, CO, $NO_X$, $PM_{10}$, and $PM_{2.5}$ from use of off-road heavy-duty construction equipment for various stages of construction. Specifically, construction-related emissions would result from the use of off-road equipment during site preparation (e.g., excavation, clearing), trenching, and construction of new facilities as part of the proposed project. Fugitive dust (e.g., $PM_{10}$ and $PM_{2.5}$) emissions would be generated primarily during the demolition and site preparation phases of project construction. Ozone precursor emissions of ROG and $NO_X$ are associated primarily with construction equipment and on-road mobile exhaust. The proposed project would also result in criteria air pollutant emissions from construction worker commute trips during various phases of project construction as well as vendor trips carrying materials to the project site.

Table 3.2-4 provides a summary of criteria air pollutant emissions that would be generated as a result of project construction activity. Table 3.2-4 evaluates the proposed project's annual level of construction emissions as well as the maximum daily emissions from two construction scenarios. As discussed under the heading "Methodology," Scenario 1 assumes the effluent discharge pipeline would be constructed by two crews working at the same time CTF modifications and the levee crossing and outfall are being constructed, and Scenario 2 assumes that pipeline construction would be limited to one crew. See Appendix C for full details and information regarding emissions modeling.

**Table 3.2-4 Summary of Modeled Emissions of Criteria Air Pollutants and Precursors by Year**

| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| 2021 annual emissions (tpy) | 0.4 | 3.7 | 2.6 | 0.0 | 0.2 | 1 |
| 2022 annual emissions (tpy) | 0.1 | 1.1 | 0.2 | 0.0 | 0.3 | 0.2 |
| SJVAPCD annual thresholds (tpy) | 10 | 10 | 100 | 27 | 15 | 15 |
| Maximum daily emissions (lb/day) (Scenario 1)[1] | 11 | 136 | 82 | <1 | 15 | 6 |
| Maximum daily emissions (lb/day) (Scenario 2)[2] | 7 | 98 | 52 | <1 | 12 | 4 |
| SJVAPCD daily thresholds (lb/day) | 100 | 100 | 100 | 100 | 100 | 100 |

Notes: tpy = tons per year; lb/day = pounds per day; SJVAPCD = San Joaquin Valley Air Pollution Control District; ROG = reactive organic gases; $NO_X$ = oxides of nitrogen; CO = carbon monoxide; $SO_X$ = oxides of sulfur; $PM_{10}$ = particulate matter with aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = particulate matter with aerodynamic diameter of 2.5 micrometers or less.

1 Although it is expected that construction of proposed project components would occur in both 2021 and 2022, construction activity would be greatest in 2021 with construction of the CTF modifications, effluent discharge pipeline, and the levee crossing and outfall occurring simultaneously in the first year and only the decommissioning of ponds A, B, and C occurring in the second year. Scenario 1 assumes that the pipeline would be executed by two construction crews.

2 Scenario 2 assumes that the pipeline would be constructed by one crew.

See Appendix C for detail on model inputs, assumptions, and project-specific modeling parameters.

Source: Modeling conducted by Ascent Environmental in September 2020

As shown in Table 3.2-4, annual emissions of criteria air pollutants would not exceed SJVAPCD's annual mass emission threshold of significance for the duration of construction. As discussed under the heading "Analysis Methodology," CEQA thresholds of significance are developed by air districts in consideration of long-term regional air quality planning efforts to protect public health. According to SJVACPD guidance, projects that generate construction emissions below these annual thresholds of significance would not conflict with an air quality plan. Based on the levels of emissions summarized in Table 3.2-4, above, construction emissions would not conflict with long-term regional air quality planning. However, as discussed above under the heading "Thresholds of Significance," annual mass emissions thresholds should not be used to determine whether a violation of an AAQS would occur, as AAQS are presented as hourly, concentration-based standards. Thus, to determine whether the project would generate substantial construction emissions that could result in a violation of an AAQS, maximum daily emissions for a worst-case construction scenario were modeled and compared to daily mass emissions screening criteria established by SJVAPCD for criteria air pollutants. These criteria were developed to assess the likelihood that a project would cause or contribute to a violation of the NAAQS or CAAQS under a worst-case construction scenario.

As shown in Table 3.2-4, above, maximum daily emissions of $NO_X$ under Scenario 1 (two construction crews constructing the pipeline simultaneously) would exceed the 100 lb/day screening criteria set forth by SJVAPCD; however, construction emissions under Scenario 2 (one pipeline construction crew) would not generate $NO_X$ emissions in excess of the 100 lb/day screening criteria. As such, unmitigated construction emissions under Scenario 1 could result in a violation of an AAQS, and impacts under Scenario 2 would be **less than significant**. This impact would be **potentially significant**.

## Mitigation Measures

### Mitigation Measure 3.2-1: Apply Tier-4 Emissions Standards to Achieve a 30-Percent Reduction in NOX Emissions from Diesel-Powered Off-Road Equipment

If project implementation requires two construction crews to construct the effluent discharge pipeline, the City shall require the construction contractor to use off-road construction equipment that meets EPA's Tier 4 emissions standards as defined in 40 Code of Federal Regulations. The construction equipment shall reduce construction emissions of $NO_X$ by 30 percent from the statewide average as estimated by CARB, such that $NO_x$ emissions do not exceed 100 lb/day. The construction contractor shall provide a plan for approval by the City that demonstrates that heavy-duty off-road vehicles (50 horsepower [hp] or more) to be used 8 hours or more during project construction achieve this 30-percent reduction. The plan shall have two components: an initial report submitted before construction and a final report submitted after project completion.

The initial report shall be submitted to the City prior to the issuance of grading permits and shall provide project and construction company information; and the equipment type, hp rating, engine model year, projected hours of use, and CARB equipment identification number for each piece of equipment in the plan. The final report shall document the end of the job, phase, or calendar year to demonstrate continued project compliance.

This requirement shall be applied to a future construction scenario that requires the use of two effluent discharge pipeline construction crews operating off-road heavy-duty equipment within the project site at the same time CTF modifications are being constructed. Future construction of the effluent discharge pipeline that could be implemented by one construction crew at the same time as CTF modifications are being constructed shall not be subject to the requirements of this mitigation measure.

Significance After Mitigation

Implementation of Mitigation Measure 3.2-1 would require the applicant to demonstrate a 30-percent reduction in $NO_X$ exhaust emissions through the use of EPA-certified Tier 4 engines if future construction of the effluent discharge pipeline would be executed by two discrete construction crews at the same time as the CTF modifications are implemented. This 30-percent reduction in $NO_X$ would be determined by the construction start year, fleet engine year mix, equipment type, horsepower, and hourly usage. A 30-percent reduction from anticipated unmitigated maximum daily emissions (136 lb/day as shown in Table 3.2-4) would lower emissions to 95 lb/day, which would be below SJVAPCD's mass emissions screening criterion for $NO_X$ emissions. Because this 30-percent $NO_X$ reduction would be a performance standard to be achieved prior to the commencement of construction, implementation of Mitigation Measure 3.2-1 would be sufficient to reduce $NO_X$ emissions to a **less-than-significant** level, thus avoiding the potential for an exceedance of an AAQS and resulting in adverse health impacts.

## Impact 3.2-2: Result in Operational Emissions of Criteria Air Pollutants and Precursors

The proposed project would not introduce new employee trips in the near term. In the long term, as evaluated in the 2013 CTF IS/MND, the Lathrop Water, Wastewater, and Recycled Water Master Plan could introduce an additional 10 one-way worker commute trips to a facility totaling less than 75,000 square feet. Based on SJVAPCD guidance, the proposed project would be below an SJVAPCD-defined "small project" and would not contribute operational emissions that could contribute to an exceedance of an air quality standard. Additionally, the proposed project would introduce a new one-fourth-hp pump, which would not support sufficient horsepower to be a notable stationary source requiring permitting oversight by SJVAPCD pursuant to Rule 2201. Emissions of Criteria Air Pollutants generated by operation of the proposed project would result in a **less-than-significant** impact.

With project implementation, though specific aspects of the treatment process would differ from existing conditions, the nature of facility operations and maintenance activities at the project site would be similar and would not result in increases in the number of employees at the project site. Therefore, no increase in operational mobile-source emissions would occur with implementation of the proposed project in the near term. CTF operations would continue to be monitored and controlled using the existing Supervisory Control and Data Acquisition system in the administration building at the CTF. Because there would be no changes in staffing, transportation emissions would not occur above baseline levels. Therefore, implementation of the proposed project would not generate transportation-related emissions of criteria air pollutants in the near term. However, as discussed in the 2013 CTF IS/MND, at full buildout (in the long term), the proposed project (a component of the Lathrop Water, Wastewater, and Recycled Water Master Plan) would generate approximately 10 one-way employee trips per day to a facility smaller than 75,000 square feet (page 3-21 of the 2013 CTF IS/MND). As discussed above under the heading "Thresholds of Significance," this level of vehicle trips would be below SJVAPCD's operational screening threshold of 1,506 trips per day for industrial facilities and 510,000 square feet of ground disturbance for general light industrial land uses. Based on guidance provided by SJVACPD, this level of mobile activity and facility size would be considered a small project and would not contribute to an exceedance of an ambient air quality standard (SJVACPD 2012).

Energy demand would be essentially the same as the demand associated with the existing CTF and recycled water system operations. At buildout of the CTF, energy demand associated with pumping to the river would increase relative to energy demand associated with development at the time of project completion. However, energy use associated with discharge to the river at buildout, except for an increase in energy use associated with the dechlorination system during river discharge, would be essentially the same as the demand associated with discharge of the effluent to land, which was previously evaluated in the 2013 CTF IS/MND (City of Lathrop 2013). The energy required to power the dechlorination system would be negligible as compared to baseline energy consumption because a one-quarter-hp pump would be used for short periods to dose effluent (Reed, pers. comm., 2020). This pump would be smaller than a permitted stationary source under SJVAPCD Rule 2201, which applies to all internal combustion engines of more than 50 hp.

For these reasons, mobile and stationary sources of pollution associated with the proposed project would not result in an exceedance of the SJVAPCD annual or daily mass emissions thresholds. This impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.2-3: Expose Sensitive Receptors to Emissions of Toxic Air Contaminants

Construction-related emissions of TACs associated with the implementation of the proposed project would not result an incremental increase in cancer risk greater than 20 in one million or a hazard index greater than 1.0 at existing or future sensitive receptors. Therefore, this impact would be **less than significant**.

The proposed project would introduce a one-fourth-hp pump to facilitate dechlorination of CTF effluent; however, a single new pump would not be considered a notable source of operational TACs. Therefore, construction-generated TACs comprise the bulk of this analysis.

Particulate exhaust emissions from diesel-fueled engines (i.e., diesel PM) were identified as a TAC by CARB in 1998. The potential cancer risk from the inhalation of diesel PM outweighs the potential for all other health impacts (i.e., non-cancer chronic risk, short-term acute risk) and health impacts from other TACs (CARB 2003:K-1). With regard to exposure of diesel PM, the dose to which receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher level of health risk for any exposed receptor. Thus, the risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period. According to the Office of Environmental Health Hazard Assessment, when a Health Risk Assessment is prepared to project the results of exposure of sensitive receptors to selected compounds, exposure of sensitive receptors to TAC emissions should be based on a 70- or 30-year exposure period; however, such assessments should be limited to the duration of activities associated with the proposed project if emissions occur for shorter periods (OEHHA 2015:5-23, 5-24).

The TAC that is the focus of this analysis is diesel PM because it is known that diesel PM would be emitted during project construction. Construction-related activities that would result in temporary, intermittent emissions of diesel

PM would be from the exhaust of off-road equipment used during site preparation and construction and on-road heavy-duty trucks. On-road diesel-powered haul trucks traveling to and from the construction area to deliver materials and equipment are less of a concern because they do not operate at any one location for extended periods of time such that they would expose a single receptor to excessive diesel PM emissions.

Based on the construction-related emissions modeling conducted (see Appendix C), maximum daily emissions of exhaust $PM_{10}$ would be less than 4 lb/day during construction. A portion of these emissions would be due to haul trucks traveling to and from the site and would not occur on the project site. This is below the SJVAPCD-recommended daily mass emission threshold of 100 lb/day. In addition, all construction activities would occur during daytime hours, which is when many residents who are employed or are students typically would not be at home, thus limiting exposure from construction-related emissions to these receptors.

Construction-related TAC emissions would not expose sensitive receptors to an incremental increase in cancer risk greater than 20 in 1 million or a hazard index greater than 1.0. The low exposure level reflects the (i) relatively low mass of diesel PM emissions that would be generated by construction activity on the project site; (ii) the relatively short duration of diesel PM-emitting construction activity at the project site; and (iii) the highly dispersive properties of diesel PM. This impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

# 3.3 TERRESTRIAL BIOLOGICAL RESOURCES

This section addresses terrestrial biological resources known or with potential to occur in the project vicinity and describes potential effects of project implementation on those resources. Aquatic biological resources are addressed in Section 3.4, "Aquatic Biological Resources," of this EIR. Terrestrial biological resources include common vegetation and habitat types, sensitive natural communities, and special-status plant and animal species. The analysis includes a description of the existing terrestrial biological resources conditions, the methods used for assessment, the potential direct and indirect impacts of project implementation on terrestrial biological resources, and mitigation measures recommended to address impacts determined to be significant or potentially significant.

Preparation of this analysis involved:

- a records search and geographic information system 5-mile-radius query of the California Natural Diversity Database (CNDDB) (CDFW 2020), the results of which are included in Appendix D1, "Database Query Results";
- review of an official list of federal candidate, proposed, threatened, and endangered species that could be affected by projects in the project area obtained from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database (USFWS 2020), included in Appendix D1, "Database Query Results";
- a California Native Plant Society Rare Plant Program database search of the Holt, Stockton West, Stockton East, Union Island, Lathrop, Manteca, Tracy, Vernalis, and Ripon U.S. Geological Survey 7.5-minute quadrangles (CNPS 2020), the results of which are included in Appendix D1, "Database Query Results";
- review of the eBird online database of bird observations (eBird 2020);
- review of the *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan* (SJMSCP);
- biological reconnaissance surveys conducted on April 16 and June 5, 2020;
- an aquatic resources delineation according to U.S. Army Corps of Engineers (USACE) methodology, conducted on April 16 and June 5, 2020;
- a protocol-level botanical survey (i.e., every species within the study area was identified to the taxonomic level necessary to determine status) on June 5, 2020 (the study area for botanical surveys, however, was restricted to the undeveloped areas with potentially suitable habitat for special-status plants; it did not include the CTF site, roadways, landscaped areas); and
- review of the previously completed documents that address biological resources in the project vicinity, including:
  - Final Subsequent EIR for the River Islands at Lathrop Project (City of Lathrop 2003) and
  - Lathrop Integrated Water Resources Master Plan EIR (City of Lathrop 2019).

Two comment letters were received during the Notice of Preparation comment period regarding biological resources from the Delta Stewardship Council (DSC) and San Joaquin Council of Governments (SJCOG). Copies of the comment letters are included in Appendix A.

Botanical surveys were conducted during the appropriate blooming period for special-status plant species that could occur on the project site (Appendix D2, "Special-Status Plant Species and Sensitive Natural Communities"). None were found to be present on the project site. Project activities would therefore have no direct or indirect impact on special-status plants. This issue is not discussed further in this EIR.

The City of Lathrop General Plan outlines policies to protect natural resources. These include conducting environmental review, managing wetlands, coordinating with the SJMSCP staff, developing appropriate mitigation measures, conducting biological surveys, planting native vegetation, and protecting Sacramento–San Joaquin Delta (Delta) habitats and levee vegetation. The proposed project would be implemented consistent with these natural resources policies. There are no tree preservation ordinances or other ordinances protecting biological resources on the project site. Because the proposed project would be consistent with the City's natural resource policies, this issue is not discussed further in this EIR.

# 3.3.1 Regulatory Setting

## FEDERAL

### Federal Endangered Species Act

Pursuant to the federal Endangered Species Act (ESA) (16 U.S. Code Section 1531 et seq.), USFWS regulates the "taking" of species listed in the ESA as threatened or endangered. In general, persons subject to the ESA (including private parties) are prohibited from taking endangered or threatened fish and wildlife species on private property and from taking endangered or threatened plants in areas under federal jurisdiction or in violation of state law. Under Section 9 of the ESA, the definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." USFWS has also interpreted the definition of "harm" to include causing significant habitat modification that could result in take.

Section 10 of the ESA applies if a nonfederal agency is the lead agency for an action that results in take and no other federal agencies are involved in permitting the action. Section 7 of the ESA applies if a federal discretionary action is required (e.g., a federal agency must issue a permit), in which case the involved federal agency consults with USFWS.

### Clean Water Act

Section 404 of the Clean Water Act (CWA) requires a project applicant to obtain a permit before engaging in any activity that involves any discharge of dredged or fill material into waters of the United States, including wetlands. Fill material is material placed in waters of the United States where the material has the effect of replacing any portion of a water of the United States with dry land or changing the bottom elevation of any portion of a water of the United States. Waters of the United States include the territorial seas and traditional navigable waters of the United States; interstate waters; all other waters where the use, degradation, or destruction of the waters could affect interstate or foreign commerce; perennial and intermittent tributaries to any of these waters; and wetlands adjacent to these waters. Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Potentially jurisdictional wetlands must meet three wetland delineation criteria: hydrophytic vegetation, hydric soil types, and wetland hydrology. Wetlands that meet the delineation criteria may be jurisdictional under Section 404 of CWA pending USACE and U.S. Environmental Protection Agency review.

The San Joaquin River within the project area is a traditional navigable water of the United States and is therefore regulated under Sections 404 and 401 of the CWA. Wastewater treatment systems designed to meet the requirements of the CWA are not considered waters of the United States. Wastewater recycling structures, including detention, retention, and infiltration basins and ponds that are constructed in uplands or in non-jurisdictional waters, are also excluded from federal jurisdiction. In addition, wastewater treatment systems that meet the physical criteria of wetlands are not included in the technical definition of a wetland because they are typically "human-induced wetlands."

Pursuant to Section 401 of the CWA, projects that apply for a USACE permit for discharge of dredged or fill material must obtain a water quality certification from the relevant regional water quality control board (RWQCB) indicating that the project would uphold state water quality standards. The CTF is within the jurisdiction of the Central Valley RWQCB. Wastewater treatment systems are excluded from the definition of waters of the United States and, therefore, are not regulated under Section 404 and Section 401 of the CWA.

Section 402 of the CWA regulates point-source discharges of pollutants, including both wastewater and stormwater discharges, into waters of the United States under the National Pollutant Discharge Elimination System (NPDES) program. The proposed project would require issuance of an NPDES permit from the Central Valley RWQCB to discharge treated effluent to the San Joaquin River. In addition, the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit, Order No. 2009-0009-DWQ [amended by 2010-0014-DWQ & 2012-0006-DWQ]/NPDES Permit No. CAS000002), which is administered by the State Water Resources Control Board, applies to all construction projects that disturb more than 1 acre of land and regulates stormwater runoff from construction sites.

### Rivers and Harbors Act of 1899

The Rivers and Harbors Act prohibits the obstruction or alteration of any navigable water of the United States. It requires authorization from USACE for any excavation or deposition of materials into these waters or for any work that could affect the course, location, condition, or capacity of rivers or harbors. The San Joaquin River within the project area is a traditional navigable water of the United States.

### Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, provides for protection of international migratory birds and authorizes the Secretary of the Interior to regulate the taking of migratory birds. The MBTA provides that it shall be unlawful, except as permitted by regulations, to pursue, take, or kill any migratory bird, or any part, nest, or egg of any such bird. Under the MBTA, “take” is defined as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities.” A take does not include habitat destruction or alteration, as long as there is not a direct taking of birds, nests, eggs, or parts thereof. The U.S. Department of the Interior’s Office of the Solicitor issued a legal, revised interpretation (Opinion M-37050) of the MBTA’s prohibition on the take of migratory bird species on December 22, 2017. Opinion M-37050 concludes that “consistent with the text, history, and purpose of the MBTA, the statute’s prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs.” According to the Opinion M-37050, take of a migratory bird, its nest, or eggs that is incidental to another lawful activity does not violate the MBTA, and the MBTA’s criminal provisions do not apply to those activities. The current list of species protected by the MBTA can be found in Title 50 of the Code of Federal Regulations, Section 10.13. The list includes nearly all birds native to the United States.

## STATE

### California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA) (14 CCR Section 670.5), a permit from the California Department of Fish and Wildlife (CDFW) is required for projects that could result in the “take” of a plant or animal species that is listed by the state as threatened or endangered. Under CESA, “take” is defined as an activity that would directly or indirectly kill an individual of a species but does not include “harm” or “harass,” as does the federal definition. As a result, the threshold for take is higher under CESA than under the federal ESA. Authorization for take of state-listed species can be obtained through a California Fish and Game Code Section 2081 Incidental Take Permit.

### California Fish and Game Code Sections 3503 and 3503.5—Protection of Bird Nests and Raptors

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 of the California Fish and Game Code states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders *Falconiformes* and *Strigiformes*), including their nests or eggs. Typical violations include destruction of active nests as a result of tree removal or disturbance caused by project construction or other activities that cause the adults to abandon the nest, resulting in loss of eggs and/or young.

### Fully Protected Species under the California Fish and Game Code

Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species and do not provide for authorization of incidental take.

## Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act (Water Code Section 13000 et seq.), waters of the state fall under the jurisdiction of the appropriate RWQCB. RWQCBs must prepare and periodically update water quality control plans (basin plans). Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control point and nonpoint sources of pollution to achieve and maintain these standards. The RWQCB's jurisdiction includes all federally protected waters, as well as areas that meet the definition of "waters of the state." "Waters of the state" is defined as any surface water or groundwater, including saline waters, within the boundaries of the state. The state definition of a wetland is an area that, under normal circumstances, (1) has continuous or recurrent saturation of the upper substrate caused by groundwater or shallow surface water or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

The RWQCB has the discretion to take jurisdiction over areas not federally protected under Section 401 of the CWA provided they meet the definition of waters of the state. The California Water Code generally regulates more substances contained in discharges and defines discharges to receiving waters more broadly than does the CWA. Actions that affect waters of the state, including wetlands, must meet the RWQCB's waste discharge requirements.

For additional information on the Porter-Cologne Water Quality Control Act and the RWQCB, see Section 3.9, "Hydrology and Water Quality," in this EIR.

## California Fish and Game Code Section 1602—Streambed Alteration

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by CDFW under Section 1602 of the California Fish and Game Code. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first notifying CDFW:

- substantially divert or obstruct the natural flow of, or substantially change or use any material from, the bed, channel, or bank of any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The regulatory definition of a stream is a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. CDFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife The City would file a notification of streambed alteration agreement with CDFW prior to undertaking any action that would result in an obstruction or alteration to the bed or bank of a river, stream, or lake.

## Sacramento-San Joaquin Delta Reform Act of 2009

In November 2009, the California Legislature enacted the Sacramento-San Joaquin Delta Reform Act (Delta Reform Act) (California Water Code Section 10610 et seq.), also known as SB 1 (Stats. 2009, 7th Ex. Sess., Ch. 5) (SB X7-1), one of several bills passed at that time related to water supply reliability, ecosystem health, and the Delta. The Delta Reform Act created the DSC, charged with developing and adopting the Delta Plan. The Delta Plan is a comprehensive, long-term management plan for the Delta that creates new rules and recommendations to further the state's coequal goals for the Delta: Improve statewide water supply reliability and protect and restore a vibrant and healthy Delta ecosystem, all in a manner that preserves, protects, and enhances the unique agricultural, cultural, and recreational characteristics of the Delta. The Delta Plan was unanimously adopted by the DSC on May 16, 2013. The Delta Plan became effective with legally enforceable regulations on September 1, 2013. Regulatory policies and recommendations applicable to biological resources include:

- Complete Bay Delta Conservation Plan (Recommendation WR R12),
- Restore Habitats at Appropriate Elevations (23 CCR Section 5006),

- Protect Opportunities to Restore Habitat (23 CCR Section 5007),
- Expand Floodplains and Riparian Habitats in Levee Projects (23 CCR Section 5008),
- Prioritize and Implement Projects that Restore Delta Habitat (Recommendation ER R2),
- Avoid Introductions of and Habitat Improvements for Invasive Nonnative Species (23 CCR Section 5009), and
- Prioritize and Implement Actions to Control Nonnative Invasive Species (Recommendation ER R7).

The Delta Plan was amended in February 2016 to include refined performance measures, which were again amended in April 2018. A September 2016 amendment made permanent an exemption for single-year water transfers to be considered as covered actions. Also, in April 2018, the Delta Plan was amended to revise Chapter 3 to include new text and recommendations for conveyance, storage, and operations, and to revise Chapter 7 to include new text and a policy for setting priorities for state investments in Delta levees.

Under the Delta Reform Act, the DSC is charged with reviewing and advising local and regional agencies regarding the consistency of local and regional planning documents with the Delta Plan. The DSC's input includes reviewing the consistency of local and regional plans with the ecosystem restoration needs of the Delta and determining whether the lands set aside for natural resource protection are sufficient to meet the Delta's ecosystem needs. The Delta Reform Act requires that "covered actions," as defined, which include plans, programs, or projects within the Primary or Secondary Zone of the Delta, be consistent with the Delta Plan.

The DSC reviews plans and projects that include land within the Delta zones, whether or not they include a covered action. Metropolitan Planning Organizations that have a planning area crossing these boundaries are required to follow a consultation procedure with the DSC. This procedure includes early coordination to determine consistency of a proposed plan or project with the Delta Plan. The proposed project is located wholly within the Secondary Zone of the Delta (DSC 2013:171).

## LOCAL

### City of Lathrop General Plan

The City of Lathrop General Plan (City of Lathrop 2004) contains the following goals and policies related to terrestrial biological resources that are relevant to the proposed project:

**GOAL No. 5:** Enhancing the Quality of Life and Biological Resources: It is a goal of the General Plan to enhance the quality of living by preventing the degradation of the natural environment, and by taking steps to off-set and alleviate the effects of that degradation which already has occurred, or which cannot be avoided. Biological resources are to be protected and preserved. Where feasible, natural conditions should be emulated as features of the community's systems of public and private open space.

<u>Part V: Resource Management Element</u>

#### Vegetation, Fish and Wildlife Policies

1. The objective of habitat retention calls for:
    - The integration of waterway habitat areas as part of the area wide system of open space.
    - The preservation of all stands of vegetation along waterways which provide habitat, and achieving a standard of "no net loss of wetland acreage".
2. The objective of habitat enhancement calls for:
    - The improvement of natural habitat along waterways.
    - The creation of new habitat within multi-purpose open space area designated for reuse of treated wastewater for wildlife management and recreation.

3. An HCP [habitat conservation plan] developed by the City, which meets the standards specified by the State of California Department of Fish and Game [now Department of Fish and Wildlife].
4. Developments proposed in sensitive biological areas shall be required to provide a site-specific analysis of the impacts of the project on fish and wildlife habitat. Because of the large-scale character of development proposed in the vicinity of biologically sensitive environments, including the conversion of several thousand acres of agricultural land to urban use, project proposals should be made to address ways in which new or enhanced habitat may be created as a trade-off to the general environmental impacts on biological resources associated with development under the General Plan.
5. Land use within areas of riparian habitat shall be restricted to nature-oriented passive recreation, which may include an arboretum, zoological gardens, hiking and nature study, essential linear infrastructure, and other such uses compatible with existing or enhanced riparian habitats. Structures, which would reduce the amount of area available for water detention, should be prohibited within the Paradise Cut flood plain unless they are accompanied by concurrent expansion of such detention areas in or adjacent to Paradise Cut.

### San Joaquin County Multi-Species Habitat Conservation and Open Space Plan

An HCP is a federal planning document that is prepared pursuant to Section 10 of ESA. An approved HCP within a defined plan area allows for the incidental take of species and habitat that are otherwise protected under the ESA during development activities.

A natural community conservation plan (NCCP) is a state planning document administered by CDFW. An approved NCCP within a defined plan area allows for the incidental take of species and habitat that are otherwise protected under CESA during growth and development activities.

#### Background

The key purpose of the SJMSCP is to provide a strategy for balancing the need to conserve open space with the need to convert open space to urban uses while protecting the region's agricultural economy; preserving landowner property rights; providing for the long-term management of plant, fish, and wildlife species, especially those that are currently listed, or may be listed in the future, under the ESA or CESA; providing and maintaining multiple-use open spaces that contribute to the quality of life of the residents of San Joaquin County; and accommodating a growing population while minimizing costs to project proponents and society at large.

San Joaquin County's past and future (2001–2051) growth has affected and will continue to affect 97 special-status plant, fish, and wildlife species in 52 vegetative communities scattered throughout San Joaquin County's approximately 1,400 square miles and approximately 900,000 acres. The SJMSCP, in accordance with ESA Section 10(a)(1)(B) and CESA Section 2081(b) Incidental Take Permits, provides compensation for the conversion of open space to non-open space uses that affect the plant, fish, and wildlife species covered by the plan, hereinafter referred to as "SJMSCP Covered Species." In addition, the SJMSCP provides compensation to offset the impacts of open space land conversions on non-wildlife-related resources, such as recreation, agriculture, scenic values, and other beneficial open space uses.

The City of Lathrop is a participant in the SJMSCP, and the proposed project is a covered activity.

The 97 SJMSCP Covered Species include 25 state-listed and/or federally listed species: 27 plants (six listed), four fish (two listed), four amphibians (one listed), four reptiles (one listed), 33 birds (seven listed), 15 mammals (three listed), and 10 invertebrates (five listed).

#### Implementation

The SJMSCP is administered by a Joint Powers Authority consisting of members of SJCOG, CDFW, and USFWS. Development project applicants are given the option of participating in the SJMSCP as a way to streamline compliance with required local, state, and federal laws regarding biological resources and typically avoid having to approach each agency independently. According to the SJMSCP, adoption and implementation by local planning jurisdictions provide full compensation and mitigation for impacts on plants, fish, and wildlife. Adoption and implementation of the SJMSCP also secure compliance pursuant to state and federal laws, such as CEQA and the Porter-Cologne Water Quality

Control Act, in regard to species covered under the SJMSCP. The SJMSCP is intended to support issuance of a Fish and Game Code Section 2081 incidental take permit.

Applicants pay mitigation fees on a per-acre basis, as established by the Joint Powers Authority, according to the measures needed to mitigate impacts on the various habitat and biological resources covered by the SJMSCP. The appropriate fees are collected by the City and remitted to SJCOG for administration. SJCOG uses the funds to acquire and preserve open space land of comparable types throughout the county, often coordinating with other private or public land trusts to purchase conservation easements or buy land outright for preservation. Development occurring on land that has been classified under the SJMSCP as "no-pay" would not be required to pay a fee. This category usually refers to already urbanized land and infill development areas. Although the fees are automatically adjusted on an annual basis, based on the construction cost index, they often cannot keep pace with the rapidly rising land prices in the Central Valley.

# 3.3.2 Environmental Setting

The project site is located in the City of Lathrop in San Joaquin County, approximately 10 miles south of the City of Stockton and directly west of the City of Manteca. The City lies east of the Coast Ranges, which separate California's Central Valley from the San Francisco Bay Area. I-5, a major north-south interstate corridor, bisects the City. The City is also connected by SR 120, which runs east-west through the southeastern-most part of the City, and by I-205, which connects I-580 to I-5 (see Figure 1-1, "Proposed Project Location").

Elements of the proposed project would be constructed (1) at the City's existing CTF, located on 54 acres of City-owned land at 18800 Christopher Way, Lathrop, CA; (2) along roadways in Lathrop between the CTF and the San Joaquin River, including Tesla Way, Harlan Road, and Inland Passage Way; and (3) along the right bank of the San Joaquin River, approximately 0.7 mile downstream of the I-5 overcrossing, at approximately river mile 55.8 (see Figure 2-4, "Proposed Project Site").

Existing land uses surrounding the project site include industrial, mostly east of I-5; agricultural, south of Sadler Oak Drive; residential, north of Sadler Oak Drive and east of Inland Passage Way; and open space along the San Joaquin River levee.

## VEGETATION COMMUNITIES AND LAND COVER TYPES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Biological reconnaissance surveys and delineation of aquatic resources were completed on the project site on April 16 and June 5, 2020; both included a survey area that encompassed the project site and adjacent habitats (survey area). Five landcover types were identified within the survey area: open water, valley oak woodland and forest, farmland, ruderal, developed, and storage ponds (Figure 3.3-1). See Section 3.4, "Aquatic Biological Resources," for a discussion of open water habitat.

### Open Water

The San Joaquin River provides open water habitat and supports a variety of wildlife, including waterfowl, shorebirds, and other birds, especially during migration, breeding, and wintering. The river also supports fish, amphibians, reptiles, and mammals. Wildlife species observed during the reconnaissance surveys include blue heron, mallard, Canada goose, striped bass, and American bullfrog. Floating aquatic and emergent plant species observed within the wetted portion of the river include Brazilian waterweed, common water-hyacinth, common bog rush, cocklebur, and dotted smartweed. Cover of emergent vegetation is sparse and restricted to a narrow fringe at the water's edge. There is approximately 0.76 acre of open water within the survey area.

### Valley Oak Woodland and Forest

The riparian vegetation along the levee of the San Joaquin River was identified as valley oak woodland and forest alliance (*Quercus lobata* forest and woodland alliance) according to the *Manual of California Vegetation* (Sawyer et al.

2009). The tree canopy is dominated by valley oak with Fremont's cottonwood, boxelder, red willow, and black willow as associates. Shrubs observed include sandbar willow, arroyo willow, common button bush, elderberry, and California rose. Grasses and other plants observed include ripgut brome, slender wild oat, rabbitsfoot grass, Bermuda grass, curly dock, blessed milkthistle, Jersey cudweed, lamp rush, tall flatsedge, white sweet clover, and California mugwort. Wildlife species observed within this land cover type include California scrubjay, western kingbird, tree swallow, red-tailed hawk, California towhee, great-tailed grackle, Bullock's oriole, and western fence lizard. Signs (i.e., tracks and scat) of raccoon and coyote were also observed. The valley oak woodland and forest alliance occupies 4.27 acres within the survey area.

## Farmland

Farmland was observed east of the San Joaquin River levee and south of Sadler Oak Drive. A portion of the farmland closer to the Union Pacific Railroad (UPRR) tracks was being graded during the aquatic resources delineation. During the reconnaissance survey, the field was covered in wheat, and one elderberry shrub was observed in the field closer to the UPRR tracks. The edges of the field contained weeds, including slender wild oat, ripgut brome, foxtail barley, wild radish, cheeseweed, blessed milkthistle, and Italian thistle. Wildlife observed within this landcover type includes American crow, yellow-billed magpie, northern mockingbird, and ring-necked pheasant. Farmland also provides cover for mammals adapted to this land cover type, including skunk, raccoon, coyote, black-tailed jackrabbit, and California ground squirrel. Approximately 6.15 acres of farmland are located within the survey area.

## Ruderal

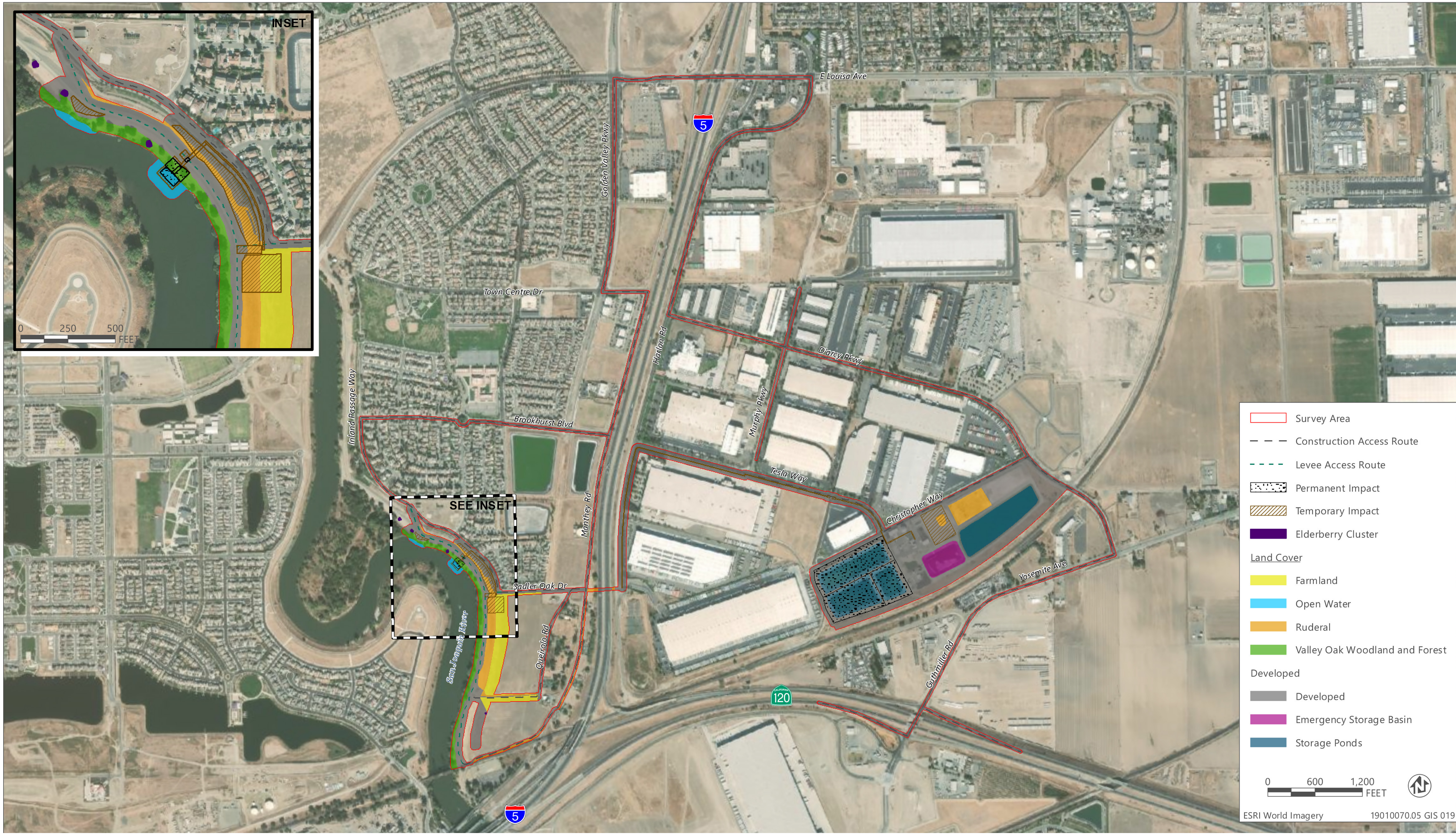
The ruderal land cover type was observed in highly disturbed areas, such as road shoulders, the median of I-5, an undeveloped lot along Tesla Way (previously known as Nestle Way), and portions of the CTF. Plants observed in this land cover type consisted mostly of weedy, nonnative plants, including blessed milkthistle, alfalfa, wild oat, ripgut brome, fiddleneck, Italian thistle, Russian thistle, curly dock, bristly oxtongue, birdsrape mustard, short podded mustard, sweetclover, redstem filaree, and pineapple weed. Occasional native plants, such as California poppy, gumweed, jimsonweed, and common fiddleneck, were also observed in this land cover type. Ruderal is the second most abundant land cover type in the survey area, occupying 8.19 acres.

## Developed

Developed land cover includes all portions where conversion of habitat into urban development has occurred. It includes the CTF, storage ponds, barren areas, streets, roadways, and I-5. Within the developed land cover type are landscaped areas planted with ornamental vegetation. Observed plant species within this land cover type include eucalyptus, pine, magnolia, privet, blueblossom ceanothus, yarrow, Cleveland sage, gum-rock rose, olive, deer grass, Japanese barberry, fortnight lily, and ornamental rose. Occasional willow and cottonwood trees are also present in the landscaped areas. Wildlife typically associated with this land cover type includes those species adapted to modified habitat. Observed species include European starling, house sparrow, rock pigeon, coyote, raccoon, Virginia opossum, cottontail rabbit, California gull, and killdeer. Native wildlife also use ornamental vegetation for nesting. A Swainson's hawk nest was observed within an ornamental pine along Tesla Way, and a loggerhead shrike nest was observed along Christopher Way, across from the proposed staging area within the CTF. The developed land cover is the most abundant land cover type in the survey area, occupying 126.37 acres. Barren and recycled water storage ponds are included as part of the developed land cover type and described below.

### Barren

Barren land cover is typically associated with severely disturbed habitats in proximity to developed land. These areas are typically devoid of vegetation. This land cover type was observed within the CTF and along the San Joaquin River levee where the area is heavily treated for weeds. Wildlife species typically associated with this land cover type, include California ground squirrels, rock pigeon, killdeer, and western fence lizard. Because of the low vegetation cover, very few wildlife species are typically observed in this land cover. The acreage of barren land cover in the action area is reflected in the Developed land cover type described above.




Source: Adapted by Ascent Environmental in 2020

Figure 3.3-1 Land Cover

#### Storage Ponds

Recycled water storage ponds are located within the CTF. These storage ponds, which are part of the wastewater treatment system, provide seasonal open water habitat that supports a variety of waterfowl and shorebirds, especially during migratory stopovers and wintering. Little or no vegetation was observed within these storage ponds because they are lined with either concrete or plastic. Observed wildlife species in this land cover type include mallard, ruddy duck, bufflehead, common merganser, killdeer, and black-necked stilt. Other bird species observed foraging in the area include black phoebe, tree swallow, cliff swallow, and loggerhead shrike. The acres of storage ponds within the survey area are reflected in the developed land cover, described above.

## PLANTS AND WILDLIFE

Plant and wildlife species observed during reconnaissance surveys conducted on April 16 and June 5, 2020, are identified in Appendix D3, "Species Observed during Field Surveys."

### Common Wildlife Species

Few species of wildlife were recorded within and adjacent to the project site during the reconnaissance surveys. Given the highly disturbed nature of the site and the extensive development surrounding the project site and vicinity, wildlife use is expected to be limited to common species adapted to urban settings and human disturbance, such as raccoon, Virginia opossum, striped skunk, coyote, and wild turkey.

### Sensitive Biological Resources

#### Special-Status Species

Special-status species are plants and animals that are legally protected under the ESA, CESA, the California Fish and Game Code, or local plans, policies, and regulations or that are otherwise considered sensitive by federal, state, or local resource conservation agencies. For this EIR, special-status species are defined as:

- species listed or proposed for listing as threatened or endangered under the ESA;
- species that are candidates for possible future listing as threatened or endangered under the ESA;
- species that are listed or proposed for listing by the State of California as threatened or endangered under CESA;
- plants considered by CDFW to be "rare, threatened, or endangered in California" (Rare Plant Ranks 1A, 1B, 2A, and 2B) (CNDDB 2020; CNPS 2020);
- species that meet the definition of rare or endangered under the State CEQA Guidelines Section 15380;
- animals fully protected in California;
- animal species of special concern to CDFW; and
- species covered by the SJMSCP.

##### Special-Status Wildlife

Table 3.3-1 provides a list of the special-status wildlife species that have been documented at the project site, within the CNDDB 5-mile-radius search area, and within the USFWS IPaC project site search area; wildlife species covered by the SJMSCP; and species for which the project site otherwise provides potentially suitable habitat. The table describes their habitat and distribution, regulatory status, and potential for occurrence within the site.

Nine special-status wildlife species have potential to occur within the project site: valley elderberry longhorn beetle, western pond turtle, Cooper's hawk, sharp-shinned hawk, Swainson's hawk, white-tailed kite, California horned lark, loggerhead shrike, and riparian brush rabbit (Table 3.3-1).

Existing conditions and potential impacts related to the fish species identified in the results of the record search—Delta smelt, longfin smelt, hardhead, and steelhead - Central Valley Distinct Population Segment —are addressed in Section 3.4, "Aquatic Biological Resources."

**Table 3.3-1 Special-Status Wildlife Species Evaluated for the City of Lathrop Consolidated Treatment Facility Surface Water Discharge Project**

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| **Insects** | | | |
| Ciervo aegialian scarab beetle *Aegialia concinna* | Interior dunes. Known only from Fresno County in sandy substrates. | --/--/Yes | **Not expected to occur:** The project site is outside of the current known range of the species. |
| Crotch bumble bee *Bombus crotchii* | Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia*, and *Eriogonum*. | --/SSC/No | **Not expected to occur:** This species was historically common in the Central Valley of California but now appears to be absent from most of it. |
| Western bumble bee *Bombus occidentalis* | Bumble bees have three basic habitat requirements: suitable nesting sites for the colonies, availability of nectar and pollen from floral resources throughout the duration of the colony period (spring, summer, and fall), and suitable overwintering sites for the queens. | --/CE/No | **Not expected to occur:** Although the project site is within a historical occurrence (circa 1962) of this species, the project site is outside of the current known range of the species. |
| Valley elderberry longhorn beetle *Desmocerus californicus dimorphus* | Riparian scrub. Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus nigra* ssp. *caerulea*). Prefers to lay eggs in elderberry stems 2-8 inches in diameter; some preference shown for "stressed" elderberries. | T/--/Yes | **May occur:** Elderberry shrubs were found within the project site, although no exit bore holes were observed during surveys. |
| Curved-foot diving beetle *Hygrotis curvipes* | Aquatic. Known only from Alameda and Contra Costa Counties. | --/--/Yes | **Not expected to occur:** The project site is outside of the current known range of the species. |
| Molestan blister beetle *Lytta molesta* | Vernal pool, wetland. Inhabits the Central Valley of California, from Contra Costa to Kern and Tulare Counties. | --/--/Yes | **Not expected to occur:** The project site does not support suitable vernal pool or wetland habitat for this species. |
| **Branchiopods** | | | |
| Conservancy fairy shrimp *Branchinecta conservatio* | Valley and foothill grassland, vernal pool, wetland. Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June. | E/--/Yes | **Not expected to occur:** No vernal pools or suitable seasonal wetlands were observed in the project site. |
| Longhorn fairy shrimp *Branchinecta longiantenna* | Valley and foothill grassland, vernal pool, wetland. Endemic to the eastern margin of the Central Coast mountains in seasonally astatic grassland vernal pools. Inhabit small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales. | E/--/Yes | **Not expected to occur:** No vernal pools or suitable seasonal wetlands were observed in the project site. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| Vernal pool fairy shrimp *Branchinecta lynchi* | Valley and foothill grassland, vernal pool, wetland. Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools. | T/--/Yes | Not expected to occur: No vernal pools or suitable seasonal wetlands were observed in the project site. |
| Mid-valley fairy shrimp *Branchinecta* sp. *nova* | Vernal pool, wetland. Vernal pools in the Central Valley. | --/--/Yes | Not expected to occur: No vernal pools or suitable seasonal wetlands were observed in the project site. |
| Vernal pool tadpole shrimp *Lepidurus packardi* | Valley and foothill grassland, vernal pool, wetland. Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid. Typically, the vernal pool tadpole shrimp is found in habitats that are deeper than 12 centimeters, pond for 15 to 30 days, and do not suffer wide daily temperature fluctuations. | T/--/Yes | Not expected to occur: The project site does not support suitable habitat for this species. |
| Fish | | | |
| Delta smelt *Hypomesus transpacificus* | Aquatic, estuary. Sacramento–San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay. Seldom found at salinities >10 parts per thousand. Most often at salinities <2 parts per thousand. | T/E/Yes | See Section 3.4, "Aquatic Biological Resources." |
| Hardhead *Mylopharodon conocephalus* | Klamath/North Coast flowing waters, Sacramento/San Joaquin flowing waters. Low- to midelevation streams in the Sacramento–San Joaquin drainage. Also present in the Russian River. Clear, deep pools with sand-gravel-boulder bottoms and slow water velocity. Not found where exotic centrarchids predominate. | --/SSC/No | See Section 3.4, "Aquatic Biological Resources." |
| Longfin smelt *Spirinchus thaleichthys* | Aquatic, estuary. Euryhaline, nektonic, and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15–30 parts per thousand but can be found in completely freshwater to almost pure seawater. | C/SSC/Yes | See Section 3.4, "Aquatic Biological Resources." |
| Steelhead- Central Valley DPS *Oncorhynchus mykiss irideus* pop. 11 | Central Valley DPS includes populations in the Sacramento and San Joaquin Rivers and their tributaries. | T/--/No | See Section 3.4, "Aquatic Biological Resources." |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| **Amphibians** | | | |
| California tiger salamander *Ambystoma californiense* | Cismontane woodland, meadow and seep, riparian woodland, valley and foothill grassland, vernal pool, and wetlands. Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma Counties DPS federally listed as endangered. Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding. | T/T/Yes | **Not expected to occur:** The project site does not support suitable aquatic habitat for this species. |
| Foothill yellow-legged frog *Rana boylii* | Frequents rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands. Range in California includes the north and central coasts and the western Sierra Nevada. | --/E,SSC/Yes | **Not expected to occur:** The project site does not provide suitable habitat for this species. |
| Western spadefoot *Spea hammondii* | Cismontane woodland, coastal scrub, valley and foothill grassland, vernal pool, and wetlands. Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying. | --/SSC/Yes | **Not expected to occur:** The project site does not provide suitable habitat for this species. |
| **Reptiles** | | | |
| Western pond turtle *Actinemys marmorata* | Quiet waters of ponds, lakes, streams, and marshes. Typically, in the deepest parts with an abundance of basking sites. | --/SSC/Yes | **May occur:** San Joaquin River supports suitable aquatic habitat for this species, and the levee shore provides suitable sunning habitat but low-quality nesting habitat because of ongoing human disturbance. |
| California glossy snake *Arizona elegans occidentalis* | Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular Ranges south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils. | --/SSC/No | **Not expected to occur**: The project site is outside of the current known range for this species. |
| Coast horned lizard *Phrynosoma coronatum (blainvillii* population) | Frequents a wide variety of habitats, commonly occurring in lowlands along sandy washes, coastal sage scrub, and chaparral in arid and semi-arid climate conditions. Species prefers friable, rocky, or shallow sandy soils. | --/SSC/Yes | **Not expected to occur**: The project site does not provide suitable habitat for this species. |
| San Joaquin coachwhip *Coluber* (=*Masticophis*) *flagellum ruddocki* | Chenopod scrub, valley, and foothill grassland. Open, dry habitats with little or no tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley. Needs mammal burrows for refuge and oviposition sites. | --/SSC/Yes | **Not expected to occur**: The project site is outside of the current known range for this species. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| Giant gartersnake *Thamnophis gigas* | Marsh and swamp, riparian scrub, wetland. Prefers freshwater marsh and low-gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California. | T/T/Yes | Not expected to occur: The San Joaquin River portion within the project site does not provide suitable aquatic habitat for this species. The nearest historic (1880) occurrence of giant garter snake is approximately 11 miles north of the project site, and the more recent occurrence (2018) is from approximately 15 miles northwest of the project site within the Stockton deep-water channel. The nearest occurrence (approximately 40 miles) south of the project site is from 1976 near the San Luis National Wildlife Refuge (CNDDB 2020). Because of the lack of suitable habitat, no nearby known occurrences, and distance between known occurrences and the project site being farther than the species is known to disperse, giant gartersnake is not expected to occur. |
| Birds | | | |
| Cooper's hawk *Accipter cooperi* | Cismontane woodland, riparian forest, riparian woodland, upper montane coniferous forest. Woodland, chiefly of open, interrupted, or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river floodplains; also, live oaks. | --/--/Yes | May occur. Trees within the riparian area of the San Joaquin River could provide suitable nesting habitat for this species. |
| Sharp-shinned hawk *Accipter striatus* | Cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland. Ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats. Prefers riparian areas. North-facing slopes with plucking perches are critical requirements. Nests usually within 275 feet of water. | --/--/Yes | May occur. Trees within the riparian area of the San Joaquin River could provide suitable nesting habitat for this species. |
| Western grebe *Aechmophorus occidentalis* | Breeds on freshwater lakes and marshes with open water bordered by vegetation. Saltwater or brackish bays, estuaries, or seacoasts in winter. Less frequently on freshwater lakes or rivers. | --/--/Yes | Not expected to occur: The project site does not support suitable nesting habitat for this species. |
| Tricolored blackbird *Agelaius tricolor* | (Nesting colony) requires open water, protected nesting substrate such as cattails or tall rushes, and foraging area with insect prey. | --/T, SSC/Yes | Not expected to occur: The project site does not support suitable nesting habitat for this species. |
| Bell's sage sparrow *Amphispiza belli belli* | Chaparral, coastal scrub. Nests in chaparral dominated by fairly dense stands of chamise. Found in coastal sage scrub in south of range. Nest located on the ground beneath a shrub or in a shrub 6–18 inches above ground. Territories about 50 yards apart. | --/--/Yes | Not expected to occur: The project site does not support suitable nesting habitat for this species. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| Golden eagle *Aquila chrysaetos* | Broadleaved upland forest, cismontane woodland, coastal prairie, Great Basin grassland, Great Basin scrub, lower montane coniferous forest, pinyon and juniper woodlands, upper montane coniferous forest, and valley and foothill grassland. Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas. | BGEPP/FP/Yes | Not expected to occur: The project site does not support suitable nesting habitat for this species. |
| Great egret *Ardea albus* | Brackish marsh, estuary, freshwater marsh, marsh and swamp, riparian forest, and wetlands. Colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes. | --/--/Yes | Not expected to occur. No rockeries or nests attributable to this species were observed during biological reconnaissance surveys. |
| Great blue heron *Ardea herodias* | Brackish marsh, estuary, freshwater marsh, marsh and swamp, riparian forest, and wetlands. Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows. | --/--/Yes | Not expected to occur. No rookeries or nests attributable to this species were observed during biological reconnaissance surveys. |
| Short-eared owl *Asio flammens* | Great Basin grassland, marsh and swamp, meadow and seep, valley and foothill grassland, and wetlands. Found in swamplands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation. | --/SSC/Yes | Not expected to occur: The project site does not support suitable nesting habitat for this species. |
| Burrowing owl *Athene cunicularia* | Occurs in open, dry grasslands, deserts, and scrublands; subterranean nester, dependent upon burrowing mammals. | --/SSC/Yes | Not expected to occur: Although a small portion of nonnative annual grassland is present within the project site, the grass height is not consistent with preferred habitat for the species. |
| Ferruginous hawk *Buteo regalis* | Great Basin grassland, Great Basin scrub, pinyon and juniper woodlands, valley and foothill grassland. Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles. | --/--/Yes | Not expected to occur: The project site does not support suitable nesting habitat for this species. |
| Swainson's hawk *Buteo swainsoni* | Great Basin grassland, riparian forest, riparian woodland, valley and foothill grassland. Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannas, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas, such as grasslands, or alfalfa or grain fields supporting rodent populations. | --/T/Yes | Present: There are several active (2020) nests in proximity to the project site. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| Cackling (=Aleutian Canada) goose *Branta hutchinsii leucopareia* | Artificial standing waters, Sacramento/San Joaquin standing waters, valley and foothill grassland. Winters on lakes and inland prairies. Forages on natural pasture or that cultivated to grain; loafs on lakes, reservoirs, ponds. | D/--/Yes | **Not expected to occur**: The project site does not support suitable nesting habitat for this species. |
| Northern harrier *Circus cyanus* | Coastal scrub, Great Basin grassland, marsh and swamp, riparian scrub, valley and foothill grassland, and wetlands. Coastal salt and fresh-water marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas. | --/SSC/Yes | **Not expected to occur**: The project site does not support suitable nesting habitat for this species. |
| Mountain plover *Chanradrius montanus* | Chenopod scrub, valley and foothill grassland. Short grasslands, freshly plowed fields, newly sprouting grain fields, and sometimes sod farms. Short vegetation, bare ground and flat topography. Prefers grazed areas and areas with burrowing rodents. | --/SSC/Yes | **Not expected to occur:** This species does not nest in the area. |
| Western yellow-billed cuckoo *Coccyzus americanus occidentalis* | Riparian forest. Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape. | T/E/Yes | **Not expected to occur:** The project site does not provide suitable habitat for this species. |
| Yellow warbler *Dendroica petechia brewsteri* | Riparian forest, riparian scrub, riparian woodland. Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascade Range and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders. | --/SSC/Yes | **Not expected to occur:** Although the project site supports riparian vegetation, existing riparian vegetation does not provide suitable nesting habitat for this species. |
| Snowy egret *Egretta thula* | Marsh and swamp, meadow and seep, riparian forest, riparian woodland, wetland. Colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes. | --/--/Yes | **Not expected to occur:** The project site does not provide suitable nesting habitat for this species. |
| White-tailed kite *Elanus leucurus* | Cismontane woodland, marsh and swamp, riparian woodland, valley and foothill grassland, and wetlands. Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching. | --/FP/Yes | **May occur:** Ruderal grassland, farmland, and the riparian corridor in the study area provide suitable foraging habitat for this species, and trees adjacent to the study area provide suitable nesting habitat. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| California horned lark *Eremophila alpestris actia* | Marine intertidal and splash zone communities, meadow and seep. Coastal regions, chiefly from Sonoma County to San Diego County. Also, main part of San Joaquin Valley and east to foothills. Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats. | --/--/Yes | **May occur.** Barren habitat within CTF could provide suitable habitat for this species. |
| Merlin *Falco columbarius* | Estuary, Great Basin grassland, valley and foothill grassland. Seacoast, tidal estuaries, open woodlands, savannas, edges of grasslands and deserts, farms and ranches. Clumps of trees or windbreaks are required for roosting in open country. | --/--/Yes | **Not expected to occur.** This species does not nest in California. |
| Prairie falcon *Falco mexicanus* | Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran Desert scrub, valley and foothill grassland. Inhabits dry, open terrain, either level or hilly. Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores. | --/--/Yes | **Not expected to occur:** The project site does not provide suitable nesting habitat for this species. |
| Greater sandhill crane *Grus canadensis tabida* | Marsh and swamp, meadow and seep, wetland. Nests in wetland habitats in northeastern California; winters in the Central Valley. Prefers grain fields within 4 miles of a shallow body of water used as a communal roost site; irrigated pasture used as loafing sites. | --/T, FP/Yes | **Not expected to occur:** This species does not nest in the San Joaquin Valley. Furthermore, the project site does not provide suitable wintering habitat for this species. |
| Yellow-breasted chat *Ictaria virens* | Riparian forest, riparian scrub, riparian woodland. Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 feet of ground. | --/SSC/Yes | **Not expected to occur:** The project site does not provide suitable habitat for this species. |
| California black rail *Laterallus jamaicensis coturniculus* | Brackish marsh, freshwater marsh, marsh and swamp, salt marsh, wetland. Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat. | --/T, FP/Yes | **Not expected to occur:** The project site does not provide suitable habitat for this species. |
| Loggerhead shrike *Lanius ludovicianus* | Broken woodlands, savanna, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting. | --/SSC/Yes | **Present:** The project site provides suitable foraging habitat, and there is a nest adjacent to the CTF facility. |
| Song sparrow ("Modesto" population) *Melospiza melodia* | Marsh and swamp, wetlands. Emergent freshwater marshes, riparian willow thickets, riparian forests of valley oak (*Quercus lobata*), and vegetated irrigation canals and levees. | --/SSC/No | **Not expected to occur:** This species is typically associated with dense riparian habitat. The project site does not provide suitable habitat for this species. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| Long-billed curlew *Numenius americanus* | Great Basin grassland, meadow and seep. Breeds in upland shortgrass prairies and wet meadows in northeastern California. Habitats on gravelly soils and gently rolling terrain are favored over others. | --/--/Yes | **Not expected to occur:** This species does not nest in San Joaquin Valley. |
| Black-crowned night heron *Nycticorax nycticorax* | Marsh and swamp, riparian forest, riparian woodland, and wetlands. Colonial nester, usually in trees, occasionally in tule patches. Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots. | --/--/Yes | **Not expected to occur.** No rookeries or nests attributable to this species were observed during biological reconnaissance surveys. |
| Osprey *Pandion haliaetus* | Riparian forest. Ocean shore, bays, fresh-water lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water. | --/--/Yes | **Not expected to occur.** No nests attributable to this species were observed during biological reconnaissance surveys. |
| American white pelican *Pelecanus erthrorhynchos* | Colonial nester on large interior lakes. Nests on large lakes, providing safe roosting and breeding places in the form of well-sequestered islets. | --/SSC/Yes | **Not expected to occur:** The project site does not provide suitable nesting habitat for this species. |
| Double-crested cormorant *Phalacrocorax auritus* | Riparian forest, riparian scrub, riparian woodland. Colonial nester on coastal cliffs, offshore islands, and along lake margins in the interior of the state. Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins. | --/--/Yes | **Not expected to occur:** The project site does not provide suitable nesting habitat for this species. |
| White-faced ibis *Plegadis chichi* | Marsh and swamp, wetlands. Shallow fresh-water marsh. Dense tule thickets for nesting interspersed with areas of shallow water for foraging. | --/--/Yes | **Not expected to occur:** The project site does not provide suitable nesting habitat for this species. |
| Bank swallow *Riparia riparia* | Riparian scrub, riparian woodland. Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole. | --/T/Yes | **Not expected to occur:** The project site does not provide suitable nesting habitat for this species. |
| Least Bell's vireo *Vireo bellii pusillus* | Riparian forest, riparian scrub, riparian woodland. Summer resident of southern California in low riparian in vicinity of water or in dry river bottoms; below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite. | E/E/No | **Not expected to occur:** The project site does not provide suitable habitat for this species. |
| Yellow-headed blackbird *Xanthocephalus xanthocephalus* | Marsh and swamp, wetland. Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds. Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects. | --/SSC/No | **Not expected to occur:** The project site does not provide suitable habitat for this species. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| **Mammals** | | | |
| Pallid bat *Antrozous pallidus* | Chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, riparian woodland, Sonoran Desert scrub, upper montane coniferous forest, valley and foothill grassland. Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites. | --/SSC/No | Not expected to occur: The project site does not provide suitable roosting habitat. |
| Ringtail *Bassaricus astutus* | Riparian habitats, forest habitats, and shrub habitats in lower to middle elevations. Usually found within 0.6 mile of a permanent water source. | --/FP/Yes | Not expected to occur. Riparian habitat within the project site does not provide suitable habitat for this species; furthermore, no tree hollows or other suitable den habitat was observed during field surveys. |
| Townsend's big-eared bat *Corynorhinus townsendii* | Occurs in a wide variety of habitats; most common in mesic (wet) sites; may use trees for day and night roosts; however, requires caves, mines, rock faces, bridges, or buildings for maternity roosts. Maternity roosts are in relatively warm sites, extremely sensitive to human disturbance. | --/SSC/Yes | Not expected to occur: The project site does not provide suitable maternity roosting habitat. Although coniferous trees in the project site may provide suitable roosting habitat, the developed habitat and ongoing human disturbance precludes the presence of this species. |
| Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis* | Riparian habitats, forest habitats, and shrub habitats in lower to middle elevations. Usually found within 0.6 mile of a permanent water source. | --/--/Yes | Not expected to occur: The project site is outside of the current known range of the species. |
| Western mastiff bat *Eumops perotis californicus* | Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels. | --/SSC/Yes | Not expected to occur: The project site does not provide suitable habitat for this species. |
| [Western] red bat *Lasiurus blossevilli* | Cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland. Roosts primarily in trees, 2-40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging. | --/SSC/Yes | Not expected to occur: Although riparian trees may provide suitable roosting habitat for this species, ongoing and frequent human disturbance (e.g., fishing, and campfires) likely preclude the presence of this species. |
| Hoary bat *Lasiurus cinereus* | Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest. Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water. | --/--/No | Not expected to occur: The project site does not provide suitable maternity roosting habitat. Although coniferous trees in the project site may provide suitable roosting habitat, the developed habitat and ongoing human disturbance preclude the presence of this species. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| [Western] small-footed myotis bat *Myotis ciliolabrum* | Wide range of habitats; mostly arid wooded and brushy uplands near water. Seeks cover in caves, buildings, mines, and crevices Prefers open stands in forests and woodlands. Requires drinking water. Feeds on a wide variety of small flying insects. | --/--/Yes | **Not expected to occur.** CNDDB-predicted habitat excludes the valley area. |
| Long-eared myotis bat *Myotis evotis* | Upper montane coniferous forest. Most common in woodland and forest habitats above 4,000 feet. Trees are important day roosts; caves and mines are night roosts. Nursery colonies usually under bark or in hollow trees, but occasionally in crevices or buildings. | --/--/Yes | **Not expected to occur.** CNDDB-predicted habitat excludes the valley area. |
| Fringed myotis bat *Myotis thysanodes* | In a wide variety of habitats; optimal habitats are pinyon-juniper, valley foothill hardwood, and hardwood-conifer. Uses caves, mines, buildings, or crevices for maternity colonies and roosts. | --/--/Yes | **Not expected to occur.** CNDDB-predicted habitat excludes the valley area. |
| Long-legged myotis bat *Myotis volans* | Upper montane coniferous forest. Most common in woodland and forest habitats above 4,000 feet. Trees are important day roosts; caves and mines are night roosts. Nursery colonies usually under bark or in hollow trees, but occasionally in crevices or buildings. | --/--/Yes | **Not expected to occur.** The project site is outside of the elevational range for this species. CNDDB-predicted habitat excludes the valley area. |
| Yuma myotis bat *Myotis yumanensis* | Lower montane coniferous forest, riparian forest, riparian woodland, upper montane coniferous forest. Optimal habitats are open forests and woodlands with sources of water over which to feed. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings, or crevices. | --/--/Yes | **Not expected to occur:** There is no suitable maternity habitat within the project site. |
| Riparian (=San Joaquin Valley) woodrat *Neotoma fuscipes riparia* | Occurs in coastal central California in habitats that exhibit a moderate vegetative canopy, with a brushy understory. Builds nests of sticks and leaves at the base of, or within, a tree or shrub, or at the base of a hill. Primarily feeds on woody plants, but also eats fungi, flowers, grasses, and acorns. | E/SSC/Yes | **Not expected to occur:** The project site does not provide suitable habitat with moderate vegetative canopy; furthermore, no middens attributable to woodrats were observed within the project site. |
| San Joaquin pocket mouse *Perognathus inornatus inornatus* | Cismontane woodland, Mojavean desert scrub, valley and foothill grassland. Grassland, oak savanna, and arid scrubland in the southern Sacramento Valley, Salinas Valley, San Joaquin Valley and adjacent foothills, south to the Mojave Desert. Associated with fine-textured, sandy, friable soils. | --/--/Yes | **Not expected to occur.** Although ruderal grassland is present within the project site, tilling for fire control and historical disturbance and development likely preclude the presence of this species. |
| Riparian brush rabbit *Sylvilagus bachmani riparius* | Riparian forest. Riparian areas on the San Joaquin River in northern Stanislaus County. Dense thickets of wild rose, willows, and blackberries. | E/E/Yes | **May occur:** There are known occurrences of this species along the San Joaquin River in the vicinity of the project site. |
| American badger *Taxidea taxus* | Occurs in open stages of shrub, forest, and herbaceous habitats; needs uncultivated ground with friable soils. | --/SSC/Yes | **Not expected to occur:** The project site does not provide suitable habitat for this species. |

| Species Name | Habitat and Distribution | Legal Status[1] Federal/State/ SJMSCP | Potential for Occurrence within the Project Site[2] |
|---|---|---|---|
| San Joaquin kit fox *Vulpes macrotis mutica* | Chenopod scrub, valley and foothill grassland. Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base. | E/T/Yes | **Not expected to occur:** The project site does not provide suitable habitat for this species. |

Notes: General references: Unless otherwise noted all habitat and distribution data provided by CNDDB.

CNDDB = California Natural Diversity Database; DPS = distinct population segment; SJMSCP = San Joaquin County Multi-Species Habitat Conservation and Open Space Plan.

[1] Legal Status Definitions

Federal:
E Endangered (legally protected)
T Threatened (legally protected)
D Delisted
C Candidate
BGEPA Bald and Golden Eagle Protection Act
State:
FP Fully protected (legally protected)
SSC Species of special concern (no formal protection other than CEQA consideration)
E Endangered (legally protected)
T Threatened (legally protected)
CE Candidate Endangered

[2] Potential for Occurrence Definitions

Not expected to occur: Species is unlikely to be present in the project area because of poor habitat quality, lack of suitable habitat features, or restricted current distribution of the species.

May occur: Suitable habitat is available in the project area; however, there are little to no other indicators that the species might be present.

Present: The species was observed on the project site during surveys.

Sources: CNDDB 2020; eBird 2020; SJCOG 2000

## Sensitive Habitats

Sensitive habitat types include those that are of special concern to CDFW, or that are afforded specific consideration through CEQA, Section 1602 of the California Fish and Game Code, the Porter-Cologne Water Quality Control Act, or Section 404/Section 401 of the CWA, as discussed in Section 3.3.1, "Regulatory Setting," above. Sensitive habitats may be of special concern to regulatory agencies and conservation organizations for a variety of reasons, including their locally or regionally declining status, or because they provide important habitat for wildlife.

Sensitive natural communities are those native plant communities defined by CDFW as having limited distribution statewide or within a county or region and that are often vulnerable to environmental effects of projects (CDFW 2018). These communities may or may not contain special-status plants or their habitat (CDFW 2018). CDFW designates sensitive natural communities based on their state rarity and threat ranking using NatureServe's Heritage Methodology. Natural communities with rarity ranks of S1 to S3, where S1 is critically imperiled, S2 is imperiled, and S3 is vulnerable, are considered sensitive natural communities to be addressed in the under CEQA and other applicable regulatory processes. (CDFW 2018). Many wetland and riparian plant communities are included on CDFW's list of special-status plant communities, and the importance of retaining, enhancing, and restricting land uses within natural habitats along waterway and riparian areas is recognized in the City's General Plan Resource Management Element (Policies 1, 2, and 8).

The riparian habitat along the San Joaquin River is composed of valley oak woodland and forest (*Quercus lobata* forest and woodland alliance) (see Figure 3.3-1, "Land Cover"). Valley oak woodland and forest has a state rarity rank of S3 and thus qualifies as a sensitive natural community as designated by CDFW. The proposed project includes 4.27 acres of valley oak woodland and forest. In addition, riparian habitat is a protected resource under Section 1602 of the California Fish and Game Code.

Waters of the United States and Waters of the State

A formal aquatic resources delineation of the proposed project survey area was conducted on April 16 and June 5, 2020 (Ascent Environmental 2020). The acreages described below reflect the extent of potentially jurisdictional wetlands and other waters.

The San Joaquin River channel (i.e., the area within the ordinary high-water mark [OHWM] of the river) would be considered waters of the United States subject to regulation under Sections 404 and 401 of the CWA because the San Joaquin River is a traditional navigable water. The San Joaquin River is also a water of the state subject to regulation under the Porter-Cologne Water Quality Control Act. The river channel consists of an area of open water, which varies as the river rises and falls through the seasons and from year to year, and a vegetated area supporting valley oak woodland and forest. As the river recedes through summer, areas of bare ground are exposed between the wetted and vegetated portions of the channel.

A total of 0.76 acre of potentially jurisdictional waters of the United States occur within the survey area of the proposed project.

## 3.3.3 Environmental Impacts and Mitigation Measures

### ANALYSIS METHODOLOGY

This impact evaluation is based on data collected during the reconnaissance surveys and aquatic resources delineation conducted on April 16 and June 5, 2020, and the botanical survey conducted on June 5, 2020; review of aerial photographs; review of relevant biological databases and the SJMSCP; and review of information from previously completed documents that address biological resources in the project vicinity.

### THRESHOLDS OF SIGNIFICANCE

An impact on terrestrial biological resources would be significant if implementation of the proposed project would:

- have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS;
- have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, or similar) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP; or
- substantially reduce the habitat of a wildlife species; cause a wildlife population to drop below self-sustaining levels; threaten to eliminate an animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

# IMPACT ANALYSIS

## Impact 3.3-1: Cause Disturbance to or Loss of Valley Elderberry Longhorn Beetle

Implementation of the proposed project may result in the direct removal of, direct damage to, or indirect damage to elderberry shrubs, which could result in mortality of the federally listed valley elderberry longhorn beetle, if present. This impact would be **potentially significant**.

Valley elderberry longhorn beetle is listed as threatened under ESA and is covered under the SJMSCP, to which the City is a signatory. The project site contains four elderberry clusters; three are located in the riparian area on the San Joaquin River levee, and one is located south of the farmland and Queirolo Road east of the levee (see Figure 3.3-1, "Land Cover"). The project site contains riparian habitat and is located within the historic riparian corridor of the San Joaquin River, which likely supported more extensive growth of elderberry shrubs before human development. The nearest known occurrence of valley elderberry longhorn beetle is approximately 5.1 miles northwest of the project site, along the Middle River. Although the species has not been documented directly on the project site, and no potential exit holes were observed on elderberry stems during the June 5, 2020, site visit, mature elderberry shrubs on the project site are likely habitat for valley elderberry longhorn beetle.

Most of the project components are located in areas that do not contain elderberry shrubs. However, construction along the levee for the proposed outfall, installation of the discharge pipe across the levee, and staging and hauling access would occur adjacent to elderberry shrubs (see Figure 3.3-1, "Land Cover"). Construction activities, such as trenching, jack and bore, and vegetation removal for the installation of the discharge pipe across the levee, staging, and driving in proximity to elderberry shrubs, could result in the direct loss of or damage to elderberry shrubs or indirect adverse effects on the root systems of elderberry shrubs in the four clusters on the project site. This impact would be **potentially significant**.

### Mitigation Measures

#### Mitigation Measure 3.3-1a: Seek Coverage under the SJMSCP

Prior to any project grading or vegetation removal, the City will seek coverage under the SJMSCP for authorized take and to mitigate habitat impacts on covered special-status species. Coverage involves compensation for habitat impacts on covered special-status species. Coverage also requires implementation of incidental take and minimization measures and payment of fees for conversion of habitat for covered special-status species. Fees paid may fund the preservation and/or creation of habitat in preserves to be managed in perpetuity. Obtaining coverage for a project includes incidental take authorization under Section 10(a) of the ESA, California Fish and Game Code Section 2081, and the MBTA. Coverage under the SJMSCP would fully mitigate all habitat impacts on covered special-status species that have no limitations to take coverage.

#### Mitigation Measure 3.3-1b: Conduct Survey for and Protect Valley Elderberry Longhorn Beetle

The City will implement the following measures, outlined in the SJMSCP, to avoid, minimize, and mitigate impacts on valley elderberry longhorn beetle:

a) A qualified biologist will be retained by the City to conduct a preconstruction survey to count and measure elderberry stems and determine whether valley elderberry longhorn beetle exit holes are present before implementation of the project for all elderberry shrubs within or adjacent to the project footprint.

b) The following measures will be implemented for all elderberry shrubs that will be retained on the project site:

   - A construction setback of 20 feet from the dripline of each elderberry shrub/cluster will be established.
   - Brightly colored flags and/or fencing will be placed around elderberry shrubs as close as possible to construction limits during project activities.

- Measures will be implemented during ground-disturbing activities on the project site to avoid altering the hydrology of the site or otherwise affecting the vigor or likelihood of survival of elderberry shrubs.
- The City and its construction contractor will ensure that project activities, such as truck traffic or other use of machinery, do not create excessive dust on the project site, such that the growth or vigor of elderberry shrubs is adversely affected. Enforcing a speed limit and watering dirt roadways are examples of methods that may be used to ensure that excessive dust is not created.
- Areas that are disturbed temporarily will be restored to predisturbance conditions (e.g., matching preconstruction contours, slopes, and drainage patterns). Erosion control measures (e.g., use of hay bales, filter fences, or other accepted equivalents) will be installed around disturbed areas within 100 feet of the dripline of elderberry shrubs.
- No insecticides, herbicides, fertilizers, or other chemicals will be used within 100 feet of the dripline of elderberry shrubs.

c) The following measures will be implemented for any elderberry shrubs that cannot be avoided and removed from the project site:

- All elderberry shrubs with evidence of valley elderberry longhorn beetle exit holes (as determined during the preconstruction survey) that cannot be avoided during project construction will be transplanted by the City to a USFWS-approved valley elderberry longhorn beetle mitigation site during the dormant period for elderberry shrubs (November 1 through February 15).
- If elderberry shrubs with evidence of valley elderberry longhorn beetle exit holes cannot be transplanted, the City will provide mitigation within SJMSCP preserves at a ratio of three new plants for each stem 1 inch in diameter or greater (as determined during the preconstruction survey) to be removed from the project site.
- For all elderberry shrubs without exit holes that cannot be avoided during project construction, the City will provide mitigation within SJMSCP preserves at a ratio of three new plants for each stem 1 inch in diameter or greater (as determined during the preconstruction survey) to be removed from the project site.

Significance after Mitigation

Implementation of Mitigation Measures 3.3-1a and 3.3-1b would reduce the potentially significant impact on valley elderberry longhorn beetle to a **less-than-significant** level because the proposed project would seek coverage under the SJMSCP, indirect effects would be minimized by implementing protective measures for elderberry shrubs to be retained on-site, and shrubs that would be removed would be transplanted or compensated for in accordance with the SJMSCP.

## Impact 3.3-2: Cause Disturbance to or Loss of Western Pond Turtle

Implementation of the proposed project would include construction within the San Joaquin River and its levee. These project components may result in disturbance to or direct loss of western pond turtle if it is present within aquatic and upland habitat. This impact would be **potentially significant**.

Western pond turtle is a California species of special concern, and the project site contains potentially suitable aquatic habitat for this species within the San Joaquin River. In addition, western pond turtle can use upland habitat for egg-laying within approximately 0.3 mile of aquatic habitat.

Implementation of the proposed project would include construction of a new outfall in the San Joaquin River, including trenching for the new effluent discharge pipe crossing the levee. These activities could result in disturbance to or direct loss (i.e., mortality) of western pond turtle if it is present within the San Joaquin River or within upland habitat. This impact would be **potentially significant**.

## Mitigation Measures

### Mitigation Measure 3.3-2: Conduct Western Pond Turtle Preconstruction Survey and Relocation

The City will implement the following measures to avoid potentially significant impacts on western pond turtle, consistent with the avoidance and minimization measures in the SJMSCP. All mitigation listed below will be limited to construction within 0.3 mile of suitable aquatic habitat:

- A preconstruction survey for western pond turtle shall be conducted by a qualified biologist before work is conducted in aquatic habitat suitable for the species. If no pond turtles are observed, no further mitigation is necessary.
- During coffer dam installation and draining of the proposed new outfall location, a qualified biologist shall be present to survey for western pond turtles. If pond turtles are observed, a qualified biologist, with approval from CDFW, shall relocate pond turtles to the nearest area with suitable aquatic habitat that will not be disturbed by project-related construction activities.
- If nesting areas for pond turtles are identified on the project site, a buffer area of 300 feet shall be established around the nesting site (which may be immediately adjacent to the river or extend up to 400 feet away from the river in uplands). These buffers shall be indicated by temporary fencing if construction has or will begin before nesting periods have ended. (The period from egg laying to emergence of hatchlings is normally April to November.)

Significance after Mitigation

Implementation of Mitigation Measure 3.3-2 would reduce the potentially significant impact on western pond turtle to a **less-than-significant** level because it would ensure that western pond turtles are removed from the site and that nest sites are protected so that project construction would not result in mortality of individuals.

## Impact 3.3-3: Cause Disturbance to or Loss of Swainson's Hawk, White-Tailed Kite, Cooper's Hawk, Sharp-Shinned Hawk, and Other Nesting Raptors

Although construction of most of the proposed project would occur within already developed areas, implementation of the proposed project could include tree removal and would include removal of other vegetation and work in proximity to known active nests. These activities may result in disturbance to nesting Swainson's hawk, white-tailed kite, and other nesting raptors, potentially resulting in nest abandonment, failure, or mortality of chicks and eggs. This impact would be **potentially significant**.

Swainson's hawk is listed as threatened under CESA, white-tailed kite is fully protected under the California Fish and Game Code, and northern harrier is a California species of special concern.

The project site and immediately adjacent areas contain suitable nesting habitat, including large trees (e.g., cottonwood, valley oak, eucalyptus, pine) for Swainson's hawk, white-tailed kite, Cooper's hawk, sharp-shinned hawk, and other nesting raptors (e.g., red-tailed hawk [*Buteo jamaincensis*], red-shouldered hawk [*Buteo lineatus*], and great horned owl [*Bubo virginianus*].

There is an active Swainson's hawk nest along Tesla Way, a suspected Swainson's hawk nest site along Yosemite Avenue, and a known Swainson's hawk nest along River Islands Parkway. In addition, a red-tailed hawk is currently nesting across the levee, southwest from the proposed outfall location.

Because most of the construction would occur within already developed areas, tree removal should not be required. Project design within the levee also is intended to avoid the removal of riparian trees. However, construction activities, including demolition, trenching, coffer dam installation by pile driving (Millett, pers. comm., 2020), and the presence of construction equipment and personnel, could result in disturbance to active nests if they are present within the vicinity of these activities, either because of noise or tree removal, if necessary. This disturbance could potentially result in nest abandonment, nest failure, or mortality of chicks or eggs. This impact would be **potentially significant**.

## Mitigation Measures

### Mitigation Measure 3.3-3: Protect Swainson's Hawk, White-Tailed Kite, Cooper's Hawk, Sharp-Shinned hawk, and Other Nesting Raptors

The City will implement the following measures consistent with the SJMSCP to avoid, minimize, and mitigate impacts on Swainson's hawk, white-tailed kite, Cooper's hawk, sharp-shinned hawk, and other nesting raptors:

- Although no tree removals are anticipated, if removal of a known nest tree is required, it shall be removed between September 16 and February 14. If removal of the tree occurs between November 1 and February 14, a qualified biologist will be retained to conduct a preactivity survey of the tree because great horned owls start nesting early and could occupy hawk nests early in the season.
- If project activity would commence between February 15 and September 15, a qualified biologist will be retained to conduct preconstruction surveys for active nests on and within 0.5 mile of the project site no more than 14 days and no less than 7 days before work begins.
- If an occupied nest is present, CDFW guidelines recommend implementation of 0.25-mile buffer for Swainson's hawk in developed areas and a 500-foot buffer for other raptors, but the size of the buffer may be adjusted if a qualified biologist and CDFW determine that reducing the buffer size would not be likely to adversely affect the nest. No project activity will commence within the buffer area until a qualified biologist confirms that the nest is no longer active or that the young have fully fledged. Monitoring of the nest by a qualified biologist will be required if the activity has potential to adversely affect the nest. If construction activities cause the nesting bird to vocalize, make defensive flights at intruders, get up from a brooding position, or fly off the nest, then the no-disturbance buffer shall be increased until the agitated behavior ceases.

<u>Significance after Mitigation</u>

Implementation of Mitigation Measure 3.3-3 would reduce the potentially significant impact on Swainson's hawk, white-tailed kite, Cooper's hawk, sharp-shinned hawk, and other nesting raptors to a **less-than-significant** level because it would require that project activities would not remove an active nest tree or disturb nest sites.

## Impact 3.3-4: Cause Disturbance to or Loss of Loggerhead Shrike, California Horned Lark, and Other Nesting Birds

Implementation of the proposed project would result in vegetation clearing and construction activities in proximity to suitable nesting habitat for loggerhead shrike, California horned lark, and other nesting birds. These activities could result in disturbance to or loss of individual nests or disruption of nesting attempts by loggerhead shrike, horned lark, and possibly other nesting bird species if they nest in the project site in the future. The disturbance to or loss of loggerhead shrike, California horned lark, and other special-status bird nests would be a **potentially significant** impact.

Loggerhead shrike, which is designated by CDFW as a species of special concern, is known to nest in the vicinity of the CTF and could nest in other locations within or near the project site. The ornamental vegetation along the proposed construction area provides suitable habitat for loggerhead shrike and other nesting birds. Similarly, vegetation along the San Joaquin River levee provides suitable nesting habitat for many bird species. The barren land cover within the CTF provides suitable habitat for California horned lark, a SJMSCP-covered species. Construction activities, including staging, trenching, grading, and vegetation removal, could disturb nesting loggerhead shrikes, California horned lark, or other birds or remove active nests if shrikes, California horned lark, or other birds are nesting in the area during construction. In addition to potential damage to or direct removal of an active nest, these construction activities could result in noise, dust, and other disturbances to nesting birds, resulting in potential nest abandonment and mortality of eggs and chicks. In addition, project construction would result in temporary disturbance to ruderal habitat and permanent loss of valley oak woodland and forest habitat suitable for loggerhead shrike; however, additional suitable and more contiguous habitat is available and relatively abundant adjacent to the project site.

The potential disturbance to or loss of loggerhead shrike, California horned lark, or other nesting bird nests as a result of project construction would be a **potentially significant** impact.

## Mitigation Measures

### Mitigation Measure 3.3-4: Protect Loggerhead Shrike, California Horned Lark, and Other Nesting Birds

Consistent with the avoidance and minimization measures in the SJMSCP, the City will implement the following measures to reduce impacts on loggerhead shrike, California horned lark, and other nesting birds:

a) A qualified biologist shall conduct a preconstruction survey for any project activity that would occur during the nesting bird season (February 1–August 31) and within 100 feet of suitable nesting habitat, including shrubs, riparian vegetation, trees, and barren areas within the CTF. The survey shall be conducted within 14 days before project activity begins.

b) If no loggerhead shrike, California horned lark, or other nesting birds are found, no further mitigation is required. If active nests are found, the qualified biologist shall establish a no-disturbance buffer around the nest location. A setback of 100 feet from nesting areas for loggerhead shrike shall be established and maintained during the nesting season for the period encompassing nest building and continuing until fledglings leave nests. This setback applies whenever construction or other ground-disturbing activities must begin during the nesting season in the presence of nests that are known to be occupied. Setbacks shall be marked by brightly colored temporary fencing. For other protected birds, the qualified biologist shall determine the buffer distance based on bird species; listing status; and other factors, including distance from construction activity, type and duration of construction, and whether the nest in within the line of sight of construction activity. The size of the buffer may be adjusted if the qualified biologist and the City, in consultation with CDFW, determine that such an adjustment would not be likely to adversely affect the nest.

<u>Significance after Mitigation</u>

Implementation of Mitigation Measure 3.3-4 would reduce the potentially significant impact on loggerhead shrike, California horned lark, and other nesting birds to a **less-than-significant** level because it would require preconstruction surveys during the nesting season and no-disturbance buffers around active nests so that project activities do not remove active nests or disturb nesting birds.

## Impact 3.3-5: Cause Disturbance to or Loss of Riparian Brush Rabbit

Implementation of the proposed project would result in riparian vegetation clearing; construction activities in proximity to occupied riparian brush rabbit habitat, which could result in the disturbance to or loss of individuals or occupied habitat; disruption of foraging attempts; or take of individual riparian brush rabbits. The disturbance to or loss of riparian brush rabbit would be a **potentially significant** impact.

Although most of the proposed project would be constructed within developed habitat that is not suitable for riparian brush rabbit, the portion of the San Joaquin River riparian habitat that would be disturbed during outfall construction and staging is immediately adjacent to the Mossdale Oxbow Preserve. The Mossdale Oxbow Preserve, which was created in 2004 by Union Pacific Homes as mitigation for its development in the City of Lathrop, is now preserved and managed specifically for the benefit of riparian brush rabbit, and the preserve is known to be occupied by riparian brush rabbit (Gantenbein, pers. comm., 2020). Although the preserve is separated from the construction area by a chain-link fence, there are holes in the fence, so the Mossdale Oxbow Preserve has direct connectivity to the riparian vegetation in the proposed outfall and new effluent discharge pipe construction area. Construction of the proposed outfall and new effluent discharge pipe would result in approximately 0.16 acre of riparian vegetation removal.

The SJMSCP requires full avoidance of riparian brush rabbit habitat along the San Joaquin River riparian area in the project vicinity because it is immediately adjacent to the Mossdale Oxbow Preserve. No conversion of occupied habitat or mortality to individual riparian brush rabbits is allowed under the SJMSCP. For the proposed project to qualify for coverage under the SJMSCP for riparian brush rabbit, a permanent setback of 300 feet from the outer edge of the dripline of riparian vegetation would be required. Because maintenance of such setbacks is not feasible, and riparian vegetation removal would occur, separate consultation with USFWS under Section 7 of the ESA, and with CDFW under CESA would be required.

Use of the proposed levee access route and staging area on the waterside crown of the levee could lead to rabbits getting struck and killed by construction vehicles. The disturbance to or loss of riparian brush rabbits and their habitat as a result of project construction would be a **potentially significant** impact.

## Mitigation Measures

### Mitigation Measure 3.3-5: Protect Riparian Brush Rabbit

The City will consult with the USFWS under ESA and with CDFW under CESA to obtain the required incidental take authorizations, if needed, and implement the following measures to avoid and minimize impacts on riparian brush rabbit:

- Levee construction and staging areas will be identified in construction drawings, and exclusion fencing will be installed to delineate their boundaries. Exclusion fencing will be maintained/repaired through the length of construction.
- Where suitable riparian brush rabbit habitat is adjacent to staging and construction areas, this habitat will be identified as an environmentally sensitive area in construction drawings and will be flagged with exclusion flagging in the field. Construction personnel, vehicles, and equipment must remain within the identified construction/staging area and outside of the environmentally sensitive area.
- Where construction or staging activities would occur within suitable riparian brush rabbit habitat, vegetation within the habitat will be removed by hand (with hand tools or hand-operated power equipment) at least 2 weeks before construction-related ground disturbance would occur in the habitat area. Vegetation will be cut to ground level and maintained at ground level throughout the construction period to deter use of the area by riparian brush rabbits.
- Before ground-disturbing activities begin, a silt fence or other suitable temporary barrier that will exclude brush rabbits from the construction area will be installed around the construction/staging area where it borders or is located within suitable habitat. Temporary signage will be placed along the rabbit exclusion fence at 150-foot intervals, warning contractors to stay within the construction area. The temporary rabbit exclusion fence and associated signage will be inspected by a qualified biologist each morning before beginning construction activities and repaired and maintained as necessary. The temporary rabbit exclusion fence and signage will be removed after construction activities are no longer required in the exclusion area.
- While construction is underway, a biological monitor will conduct daily surveys of the construction area before the start of activities for the day to determine whether riparian brush rabbits are within the construction area. If riparian brush rabbits are located within the construction area, construction activities will not start until the animal has left the construction area on its own or is removed by an approved permitted biologist.
- Trash, including food wrappings, will be removed from the levee construction/staging areas daily to avoid attracting potential predators, such as feral cats, dogs, coyote, or foxes to the area.

Additional measures may be developed with USFWS and CDFW during the consultation process. These measures may include, but would not be limited to, compensation for disturbance to or loss of habitat, implementation of a trapping program to remove feral animals and rats from the Mossdale Oxbow Preserve, and coordination to assist with the USFWS captive breeding program. Compensation for disturbance to or loss of habitat could include enhancement of existing habitat and creation of additional habitat, including development and implementation of a riparian vegetation restoration plan after construction along the levee has been completed.

#### Significance after Mitigation

Implementation of Mitigation Measure 3.3-5 would avoid or minimize the impact on riparian brush rabbit. The impact would be minimized by conducting preconstruction surveys, conducting daily surveys of construction areas, using exclusion fencing, and minimizing vegetation removal. Additional measures developed though consultation with

USFWS and CDFW may include supporting the existing USFWS captive breeding program to establish new populations in appropriate habitat and purchasing or creating compensatory habitat, resulting in no net loss of riparian habitat for riparian brush rabbit. Therefore, the implementation of this mitigation measure would reduce the potential impact on riparian brush rabbit to **less than significant**.

## Impact 3.3-6: Cause Disturbance to and Loss of Waters of the United States and State

Construction of the proposed outfall in the San Joaquin River would result in permanent fill of approximately 0.10 acre of waters of the United States and state. Therefore, implementation of the proposed project would result in a substantial adverse effect on federally protected and state-protected waters. Loss of wetlands and other waters of the United States and state would be a **significant** impact.

Construction of the outfall would result in the temporary disturbance of 0.07 acre of waters and direct fill of approximately 0.10 acre of wetlands and other waters. These acreages are based on the results of an aquatic resources delineation conducted by Ascent Environmental on June 5, 2020. The delineation has not been verified by USACE. The area of waters of the United States and state was delineated based on the OHWM of the San Joaquin River. The proposed project would use coffer dams to surround the proposed outfall location in order to drain, with the use of pumps, the work area and reach the desired depth for the proposed outfall. This activity would result in the temporary disturbance of the San Joaquin River. Construction of the outfall, including installation of the concrete headwall, placement of articulated concrete blocks below the concrete headwall, and placement of riprap above the headwall and against the levee, would result in the permanent fill of a portion of the San Joaquin River. Therefore, project implementation would result in the temporary disturbance and permanent loss of waters of the United States and state. This impact would be **significant**.

## Mitigation Measures

### Mitigation Measure 3.3-6: Compensate for Loss of Waters of the United States and State

The City will implement the following measures to compensate for the loss of waters of the United States and state:

a) The City submitted the aquatic resources delineation report to USACE, and requested a jurisdictional determination. Based on the jurisdictional determination, the City will confirm the exact acreage of waters of the United States and waters of the state that would be filled as a result of project implementation.

b) The City will replace on a "no net loss" basis (minimum 1:1 ratio) (in accordance with USACE and/or Central Valley RWQCB) the acreage and function of all wetlands and other waters that would be removed, lost, or degraded as a result of project implementation. Wetland habitat will be replaced or enhanced at a location acceptable to or approved by USACE and the Central Valley RWQCB, either on-site, by participation in the National Fish and Wildlife Foundation in-lieu fee program, by the purchase of mitigation credits at an approved mitigation bank (e.g., Cosumnes Floodplain Mitigation Bank), or any combination thereof. The acreage and location of mitigation will be determined during the Section 401 and Section 404 permitting processes.

c) The City will obtain a USACE Section 404 permit and RWQCB Section 401 water quality certification before any groundbreaking activity within 50 feet of any wetland or water of the United States or state. The City will implement all permit conditions.

d) A dewatering and diversion plan for the San Joaquin River will be developed as necessary. No groundbreaking activities will occur until the dewatering and diversion plan has been approved by the resource agencies.

<u>Significance after Mitigation</u>

Implementation of Mitigation Measure 3.3-6 would reduce the significant impact on waters of the United States and waters of the state to a **less-than-significant** level because it would ensure no net loss of functions and acreage of wetlands, other waters of the United States, and waters of the state.

## Impact 3.3-7: Cause Disturbance to or Loss of Riparian Habitat

Implementation of the proposed project, including construction of the proposed outfall and installation of the new effluent discharge pipe along the San Joaquin River levee, would result in disturbance to or direct removal of riparian vegetation. This impact would be **significant**.

Riparian habitats are regulated by CDFW under the California Fish and Game Code. In addition, the Resource Management Element of the City General Plan contains several policies calling for the retention, enhancement, and restriction of land use in natural habitat along waterways and in riparian areas (Policies 1, 2, and 8). Furthermore, riparian habitat is a covered habitat under the SJMSCP. The riparian habitat along the San Joaquin River is composed of valley oak woodland and forest (*Quercus lobata* forest and woodland alliance), which has a state rarity rank of S3 and is designated as a sensitive natural community by CDFW. Implementation of the proposed project would result in the removal of shrubs, including buttonbush and willow, and would require working within the dripline of two valley oak trees. Overall, the acreage affected is approximately 0.16 acre of valley oak woodland and forest riparian habitat. Some portions of the riparian vegetation cover are within the OHWM of the San Joaquin River and are therefore considered waters of the United States and state. Some other portions of the riparian vegetation cover are above the OHWM of the river and are therefore not under federal jurisdiction. All portions of the river and associated riparian habitat are protected under Section 1602 of the California Fish and Game Code. The disturbance to or removal of riparian habitat would be a **significant** impact.

## Mitigation Measures

### Mitigation Measure 3.3-7: Minimize and Compensate for the Loss of Riparian Habitat

The City will implement the following measures, which in addition to others, include the incidental take and avoidance measures in the SJMCSP for riparian habitat:

- Require appropriate erosion control measures (e.g., use hay bales, filter fences, vegetative buffer strips, or other accepted equivalents) to reduce the amount of siltation and contaminated runoff from the project site.
- Retain emergent (rising out of water) and submergent (covered by water) vegetation.
- Retain vegetation as practical within the constraints of the proposed development as determined by the SJMSCP Joint Powers Authority with the concurrence of the permitting agencies' representatives on the Technical Advisory Council. Rapidly sprouting plants, such as willows, should be cut off at the ground and root systems left intact, when removal is necessary.
- The City will submit a notification of lake and streambed alteration to CDFW for work within the bed, bank or channel of the San Joaquin River.
- The acreage of valley oak woodland and forest habitat removed will be replaced or restored/enhanced at a minimum 1:1 ratio with habitat comprising ecological conditions similar to those provided by the habitat removed from the project site, including similar species composition and diversity and functional organization. Habitat restoration, enhancement, and/or replacement will be at a location and by methods acceptable to SJMSCP staff and/or CDFW. This may include on-site restoration of riparian habitat, purchase of mitigation credits at a CDFW-approved mitigation bank (e.g., Cosumnes Floodplain Mitigation Bank), or a combination of these.
- Compensatory mitigation requirements in compliance with the SJMSCP will be calculated from the edge of a 100-foot buffer zone to the edge of the riparian vegetation as it extends into the river.

#### Significance after Mitigation

Implementation of Mitigation Measure 3.3-7 would minimize the loss of riparian habitat and sensitive natural communities by restoring habitat, implementing measures to reduce erosion and runoff, and compensating for loss of habitat to ensure no net loss through the permitting process. Therefore, implementation of this mitigation measure would reduce the potential impact on riparian habitat to **less than significant**.

## Impact 3.3-8: Cause Disturbance to or Loss of Terrestrial Wildlife Corridors

Most of the proposed project would be constructed within already developed habitat and therefore would have no impact on wildlife corridors. However, the SJMSCP identifies the San Joaquin River as a wildlife corridor, and project activities within the river and its levee would result in temporary disturbance to this wildlife corridor. Because the proposed outfall would be constructed below the OHWM of the river and within the levee, no permanent barrier to the movement of terrestrial wildlife would occur. The impact on terrestrial wildlife movement would be **less than significant.**

The portion of the proposed project in the San Joaquin River and its levee would occur in the San Joaquin River Wildlife Corridor outlined in the SJMSCP. Currently, the levee area experiences daily use by the local residents for exercise, as well as for fishing from the banks, which discourages wildlife movement during daylight hours. Although the proposed construction would further disrupt potential movement temporarily along the riparian area and levee during daylight work hours, animals would be able to resume movement after construction ends at the end of the day and at night, when most wildlife movement occurs along the riverbank. Furthermore, because project elements would either be below the OHWM of the river or within the actual levee, there would be no permanent structure to act as a barrier to terrestrial wildlife movement along the San Joaquin River Wildlife Corridor. Therefore, the impact on terrestrial wildlife corridors would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

# 3.4 AQUATIC BIOLOGICAL RESOURCES

This section addresses the aquatic biological resources (i.e., fish, phytoplankton, zooplankton, and benthic macroinvertebrate [BMI] communities) known to occur, or with potential to occur, in the affected environment of the San Joaquin River. The affected environment for aquatic biological resources includes the proposed CTF outfall location in the river and the distance upstream to which reverse-flow conditions would transport CTF discharges, and downstream reaches of the San Joaquin River and areas of Sacramento–San Joaquin Delta (Delta) waters. The analysis describes potential changes in the condition of the San Joaquin River as a result of implementing the proposed project and evaluates impacts these changes would have on the river's aquatic biological resources. This section includes environmental and regulatory settings for aquatic biological resources (including brief discussions on key environmental requirements of fish species of primary management concern occurring within the affected environment), followed by discussions of the impact assessment methodology; thresholds of significance; and impact assessments, determinations, and mitigation measures for the proposed project.

## 3.4.1 Regulatory Setting

The National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) manages anadromous fish. U.S. Fish and Wildlife Service (USFWS) manages nonanadromous fish and other aquatic biological resources in the project area is the responsibility of the. The California Department of Fish and Wildlife (CDFW) acts as state trustee for aquatic species, including anadromous fish. These three agencies, either independently or in collaboration with other state and federal agencies, implement numerous fish management and restoration plans and initiatives in the region. Most of these plans and initiatives are focused on the Sacramento and San Joaquin Rivers, their primary tributaries, and the Delta, which are used by anadromous fishes.

### FEDERAL

#### Federal Endangered Species Act

The federal Endangered Species Act (ESA) regulates threatened, endangered, and other special-status fish species. NMFS and USFWS jointly implement the ESA for aquatic species. USFWS regulates the taking of aquatic species, including nonanadromous fish, amphibians and aquatic reptiles, and invertebrates listed as threatened or endangered under the ESA. NMFS regulates and protects marine and anadromous fish species listed as threatened or endangered under the ESA.

In general, persons subject to the ESA (including private parties) are prohibited from "taking" endangered or threatened fish and wildlife species on private property, and from "taking" endangered or threatened plants in areas under federal jurisdiction. Under the ESA, the definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Both USFWS and NMFS have also interpreted the definition of "harm" to include significant habitat modification that could result in take. If a proposed project would result in take of a federally-listed species, the project applicant must either obtain an incidental-take permit, under Section 10(a) of the ESA, or if a federal discretionary action is involved, the federal agency must consult with USFWS or NMFS under Section 7 of the ESA to obtain a Biological Opinion with an Incidental Take Statement.

#### Magnuson-Stevens Fishery Conservation and Management Act of 1996

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) defines essential fish habitat (EFH) as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The Magnuson-Stevens Act requires federal agencies to consult with NMFS when a project has the potential to adversely affect EFH. States are not required to consult with NMFS; however, NMFS is required to develop EFH conservation recommendations for any state agency activities that would affect EFH. Although the concept of EFH is similar to critical habitat of the ESA, measures recommended by NMFS or a regional fisheries management council to protect EFH are advisory, not prescriptive.

# STATE

## California Endangered Species Act

CDFW is responsible for the implementation of the California Endangered Species Act (CESA), and reviews and analyzes petitions for the listing of species to CESA. Projects that have the potential to take CESA-listed species must consult with CDFW to obtain an Incidental Take Permit. Similarly, if a species is listed to both the federal ESA and CESA, consultation with NMFS and/or USFWS and CDFW may be required and could result in a Consistency Determination by CDFW. Pursuant to Section 2081, take of a listed species is prohibited without an Incidental Take Permit. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The CESA definition of "take" does not include "harm" or "harass" as is included in the federal act. Habitat is not necessarily protected under CESA unless its removal or alteration is directly linked to losses of CESA-listed species.

## Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) provides water quality standards for waters of the San Joaquin River and Delta, and implementation of Basin Plan policies is under the purview of the Central Valley Regional Water Quality Control Board (RWQCB) (Central Valley RWQCB 2018). Existing beneficial uses identified in the Basin Plan that are directly associated with aquatic resources within the affected environment include:

- Warm Freshwater Habitat (WARM) – Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- Cold Freshwater Habitat (COLD) – Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- Migration of Aquatic Organisms (MIGR) – Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.
- Spawning, Reproduction, and/or Early Development (SPWN) – Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
- Rare, Threatened, or Endangered Species (RARE) – Uses of water that support aquatic habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

## San Francisco Bay/Sacramento-San Joaquin Delta Water Quality Control Plan

The *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) provides protections for the Delta in addition to the Central Valley RWQCB Basin Plan (SWRCB 2006). The Bay-Delta Plan is focused on the protection of beneficial uses of the Delta that require control of salinity (caused by saltwater intrusion, water project operations, municipal discharges, and agricultural drainage). The Bay-Delta Plan identifies beneficial uses, water quality objectives, and an implementation program. The designated beneficial uses of the Delta include all the same uses related to aquatic biological resources identified in the Basin Plan (i.e., warm and cold freshwater habitat, migration, spawning and rare, threatened, or endangered species) and one other, as follows:

- Estuarine Habitat (EST) - Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

## Water Quality Control Plan for Control of Temperatures in Coastal and Interstate Waters and Enclosed Bays and Estuaries of California

The Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) sets limits for "thermal waste" and "elevated temperature waste" discharged into coastal and interstate waters and enclosed bays and estuaries of California. The Thermal Plan also empowers RWQCBs, with State Water Resources Control Board concurrence, to grant discharger exceptions from the plan's specific water quality objectives. Estuarine waters are considered to extend from "a bay or the open ocean to the upstream limit of tidal action" (SWRCB 1975). In the area of the proposed project, the San Joaquin River flow is subject to tidal influence. Therefore, the Thermal Plan's temperature objectives for effluent and receiving waters generally apply to discharges within this reach of the river.

- **Objective 5A(1)a**: The maximum temperature shall not exceed the natural receiving water temperature by more than 20°F;
- **Objective 5A(1)b**: Elevated temperature waste discharges, either individually or combined with other discharges, shall not create a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, that exceeds 25 percent of the cross-sectional area of a main river channel at any point; and
- **Objective 5A(1)c**: No discharge shall cause a surface water temperature rise greater than 4°F above the natural temperature of the receiving waters at any time or place.
- **Objective 5A(1)d**: Additional limitations shall be imposed when necessary to assure protection of beneficial uses.

## LOCAL

### City of Lathrop General Plan

The following goal in the City of Lathrop General Plan is applicable to the proposed project:

**GOAL No. 5. Enhancing the Quality of Life and Biological Resources:** It is a goal of the General Plan to enhance the quality of living by preventing the degradation of the natural environment, and by taking steps to off-set and alleviate the effects of that degradation which already has occurred or which cannot be avoided. Biological resources are to be protected and preserved. Where feasible, natural conditions should be emulated as features of the community's systems of public and private open space.

### San Joaquin County Multi-Species Habitat Conservation and Open Space Plan

The *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan* (SJMSCP), in accordance with ESA Section 10(a)(1)(B) and CESA Section 2081(b) Incidental Take Permits, provides compensation for the Conversion of Open Space to non-Open Space uses which affect the plant, fish and wildlife species covered by the SJMSCP. The key purpose of the SJMSCP is to provide a strategy for balancing the need to conserve Open Space and the need to convert Open Space to non-Open Space uses while protecting the region's agricultural economy; preserving landowner property rights; providing for the long-term management of plant, fish and wildlife species, especially those that are currently listed, or may be listed in the future, under the ESA or CESA; providing and maintaining multiple-use Open Spaces, which contribute to the quality of life of the residents of San Joaquin County; and accommodating a growing population while minimizing costs to project proponents and society at large.

# 3.4.2 Environmental Setting

This section describes the fish populations and other aquatic biological resources within the San Joaquin River in the vicinity of the proposed Lathrop CTF effluent discharge location and the downstream Delta waters. For the purposes of this assessment, the affected environment includes the San Joaquin River in the vicinity of the proposed project and downstream Delta waters. See Section 3.9, "Hydrology and Water Quality," for background information on the general hydrology and water quality within the affected environment.

The sections below provide an overview of the fisheries resources, including special-status fish species, the native fish community within the San Joaquin River and downstream Delta waters, BMI and plankton communities (i.e., prey resources for fish), and designated critical habitat, within the affected environment. Evaluating potential impacts on fish and other aquatic biological resources requires an understanding of fish and other species' life histories and life-stage-specific environmental requirements.

The Delta is a triangle-shaped, tidally influenced estuary with an area of approximately 80 square miles. The Delta is composed of deep channels, shallow sloughs, and wetlands that all experience various conditions of tidal seawater exchange, freshwater inflows, managed flows, and associated variable salinity conditions. A variety of freshwater, brackish water, and saltwater fish species reside in the Delta, or rely on the Delta for one or more of their life stages, as well as a large variety of primary producers (e.g., algae and aquatic plants) and invertebrate species (e.g., zooplankton and BMI, including mollusks, aquatic insects, and crustaceans).

The 366-mile-long (589 kilometers) San Joaquin River originates in the southern Sierra Nevada and flows north through the San Joaquin Valley before it confluences with the Sacramento River in the Delta, upstream of Suisun Bay. The San Joaquin River is among the most heavily dammed and diverted of California's rivers, which contributes to poor habitat values throughout much of its length. The San Joaquin River channel is approximately 300 feet wide at the site of the proposed project. The project site is tidally influenced, with daily ebb and flood flow direction past the site under normal conditions, particularly during lower river flow months of the summer and fall period, with flows often moving 1–2 miles upstream of the site before reversing direction.

## FISH SPECIES

The region of the eastern Delta, and lower San Joaquin River corridor within the Delta (which leads to the upper major San Joaquin River tributaries of the Stanislaus, Tuolumne, and Merced Rivers) provides habitat for about 120 native and introduced resident and anadromous fish species. A list of the native fish species endemic to California that may occur seasonally or year-round in the vicinity of the CTF is provided in Table 3.4-1. Twelve of the species/runs have been given a special-status designation by NMFS, USFWS, or CDFW due to concern over declining numbers.

**Table 3.4-1 Native Fish Species Potentially Occurring in the San Joaquin River and the Delta, and Their Status under the ESA and CESA**

| Common Name | Scientific Name | Special-Status Designation [1] State | Special-Status Designation [1] Federal | San Joaquin River Presence | Delta Presence |
|---|---|---|---|---|---|
| Family Acipenseridae (Sturgeon) | | | | | |
| Green sturgeon | *Acipenser medirostros* | SSC | FT | X | X |
| White sturgeon | *A. transmontanus* | -- | -- | X | X |
| Family Catostomidae (Suckers) | | | | | |
| Sacramento sucker | *Catostomus occidentalis* | -- | -- | X | X |
| Family Cottidae (Sculpins) | | | | | |
| Prickly sculpin | *C. asper* | -- | -- | X | X |
| Family Cyprinidae (Minnows) | | | | | |
| Hardhead | *Mylopharodon conocephalus* | SSC | -- | X | X |
| Sacramento pikeminnow | *Ptychocheilus grandis* | -- | -- | X | X |
| Hitch | *Lavinia exilicauda* | -- | -- | X | X |
| California roach | *Hesperoleucus symmetricus* | -- | -- | X | X |
| Sacramento splittail | *Pogonichthys macrolepidotus* | SSC | -- | X | X |
| Sacramento blackfish | *Orthodon microlepidotus* | -- | -- | X | X |
| Family Embiotocidae (Surfperches) | | | | | |
| Tule perch | *Hysterocarpus traskii* | -- | -- | X | X |
| Family Gasterosteidae (Sticklebacks) | | | | | |
| Threespine stickleback | *Gasterosteus aculeatus* | -- | -- | X | X |

| Common Name | Scientific Name | Special-Status Designation [1] State | Special-Status Designation [1] Federal | San Joaquin River Presence | Delta Presence |
|---|---|---|---|---|---|
| **Family Osmeridae (Smelts)** | | | | | |
| Delta smelt | *Hypomesus transpacificus* | SE | FT | X | X |
| Longfin smelt | *Spirinchus thaleichthys* | ST | FC | X | X |
| **Family Petromyzontidae (Lampreys)** | | | | | |
| Pacific lamprey | *Lampetra tridentata* | -- | SC | X | X |
| River lamprey | *L. ayresi* | SSC | -- | X | X |
| **Family Salmonidae (Salmon and Trout)** | | | | | |
| Chinook salmon | *Oncorhynchus tshawytscha* | | | | |
| Winter-run | | SE | FE | | X |
| Spring-run | | ST | FT | X | X |
| Fall-run | | SSC | SC | X | X |
| Late fall–run | | SSC | SC | | X |
| Steelhead | *O. mykiss* | -- | FT | X | X |
| Rainbow trout (resident) | *O. mykiss* | -- | -- | -- | -- |

[1] Status Codes:

FC = federal candidate for listing as threatened or endangered.
FE = federally listed as endangered.
FT = federally listed as threatened.
SE = listed as endangered by the State of California.
ST = listed as threatened by the State of California.
SSC = California species of special concern.
SC = federal species of concern.

Sources: Moyle 2002; Moyle et al. 2015

Nonnative fish species present in the project area represent a diverse array of trophic levels, and adaptations. Many centrarchids (e.g., largemouth bass, smallmouth bass, sunfish) and ictalurids (i.e., catfish and bullheads) may prey on eggs, juveniles, and small-bodied adult native and nonnative fish. American shad and striped bass, both introduced intentionally to provide a sport fishery, may also feed on juvenile fish, including natives. Western mosquitofish, introduced as a mosquito-control agent, provide a forage base for native and nonnative piscivores (i.e., fish that eat other fish).

Introduced and native resident fish species typically have higher thermal tolerances than migratory species that use the San Joaquin River. For example, Sacramento pikeminnow is a native resident fish that prefers temperatures cooler than 82.4°F. However, they can withstand water temperatures up to 100°F (University of California, Davis 2017a) for short exposures. Many of the introduced Central Valley species are even more thermally tolerant than native Central Valley fishes. For example, introduced species such as western mosquitofish can withstand temperatures up to 107°F (University of California, Davis 2017b). Table 3.4-2 provides a summary of the upper temperature limits and preferred temperature ranges for native resident and migratory fish species that use the San Joaquin River in the vicinity of the proposed project.

**Table 3.4-2 Summary of Upper Temperature Limits and Preferred Temperature Ranges for Native Resident and Migratory Fish Species and Their Prey Resources That Use the San Joaquin River**

| Fish Species or Prey Resource | Upper Temperature Limit Thermal Tolerance (°F) | Upper Temperature Limit Endpoint Reported (°F) | Preferred Temperatures (°F) | Life Stage | References |
|---|---|---|---|---|---|
| Native Species | | | | | |
| California roach | 97–100 | Extreme tolerance | <Mid-80s (cooler for spawning) | Juvenile/adult | Cech et al. 1990; CDFG 2010a |
| Chinook salmon | Mid-70s | Can tolerate chronic exposures when acclimated to waters from the mid-50s to 60 degree | 53.6–68 | Juvenile | Boles 1988; Lehman et al. 2017; Poletto et al. 2017 |
| | 76–80 | Can tolerate short-term exposures with no observable effect on upstream migration | 50–60.8 | Adult | Cramer and Hammack 1952; Boles 1988; McCullough 1999; Moyle 2002 |
| Delta smelt | 85.5 | Critical thermal maximum when acclimated to 60.8 | <72 | Juvenile and subadult | Swanson and Cech 1995; Bennett 2005; Davis et al. 2019 |
| | 83.1 | Critical thermal maximum when acclimated to 61.9 | <72 | Adult | Komoroske et al. 2014 |
| Green sturgeon | 86–94.1 | When acclimated to temperatures in the 50s and 60s | 59–66.2 | Juvenile [1] | Mayfield and Cech 2004; Sardella et al. 2008; Verhille et al. 2016; Rodgers et al. 2018a |
| Hardhead | 85.5–91.1 | ▸ 85.5 when acclimated to 51.8<br>▸ 91.1 when acclimated to 77 | ~67 | Juvenile | Thompson et al. 2012 |
| | 85.5–98.1 | ▸ 85.5 when acclimated to 51.8<br>▸ 98.1 when acclimated to 77 | ~69 | Adult | Moyle 2002; Thompson et al. 2012 |
| Hitch | 100.4 | When acclimated to 86 | 77–84.2 | Juvenile/adult | Moyle 2002; CDFG 2010c |
| Longfin smelt | 76.7 | When acclimated to 57 | 55.4–60.8 | Juvenile | Jeffries et al. 2016; CDFW 2020 |
| | 71.6 | Few fish are found above this temperature in the wild | 60.8–64.4 | Adult | Robinson and Greenfield 2011 |
| Pacific lamprey | 77–83 | Found to reside in rivers with these temperatures | <68 | Juvenile/adult | Mallatt 1983; Claire 2004; Clemens et al. 2009, cited in PLTW 2017; Clemens et al. 2016, cited in PLTW 2017 |
| Prickly sculpin | >82.4 | Temperature tolerance data are not available, but populations in Clear Lake, California, regularly experience temperatures warmer than 82.4 | 77-82.4 [2] | Juvenile/adult | Brown et al. 1995; Moyle et al. 2015 |
| River lamprey [3] | 77–83 | Pacific lamprey found to reside in rivers with these temperatures | <68 | Juvenile/adult | Mallatt 1983; Claire 2004; Clemens et al. 2009, cited in PLTW 2017; Clemens et al. 2016, cited in PLTW 2017 |
| Sacramento blackfish | 86.6–90.4 | ▸ 86.6 when acclimated to 50<br>▸ 90.4 when acclimated to 59 | ~35–75 | Juvenile/adult | Moyle and Knight 1984; Wang 1986 |
| Sacramento pikeminnow | 86–100.4 | Can tolerate these warm temperatures but experience high mortality during abrupt changes to warmest temperatures | 59–82 | Juvenile/adult | Cech et al. 1990; Bettleheim 2001; University of California, Davis 2017a |

| Fish Species or Prey Resource | Upper Temperature Limit Thermal Tolerance (°F) | Upper Temperature Limit Endpoint Reported (°F) | Preferred Temperatures (°F) | Life Stage | References |
|---|---|---|---|---|---|
| Sacramento splittail | 91.4 | Loss of equilibrium when acclimated to 68 | <68 | Juvenile | Young and Cech 1996; CDFG 2010d |
| | 84.2 | Loss of equilibrium when acclimated to 62.6 | 41–75.2 | Adult | Young and Cech 1996; Moyle 2002; Moyle et al. 2004 |
| Sacramento sucker | <86 | ▶ Mortality occurred while slowly acclimating fish to 86 from an original temperature of 50<br>▶ Upper temperature limits in the wild are between 78.8 and 82.4 | 50–72 | Adult [4] | Cech et al. 1990; Moyle and Knight 1984; Myrick and Cech. 2000a |
| Steelhead | Extended exposures to upper 70s and short exposures to low 80s | When acclimated to temperatures between low 50s and mid-60s | 60–65 | Juvenile | Cherry et al. 1975; Myrick and Cech 2000b, 2005; Verhille et al. 2016 |
| | >76 | Avoidance behavior and migration blockage in Pacific Northwest rivers | 60–65 | Adult | Cherry et al. 1975; Washington State Department of Ecology 2002 |
| Threespine stickleback | ~92–94 | ▶ Up to 94 when acclimated to 72.8<br>▶ Mortality was observed 20 days poststocking when maximum temperature were above 92/93 | 70–75.2 | Juvenile/adult | Feldmeth and Baskin 1976; Wang 1986; Offill and Walton 1999; Moyle 2002 |
| White sturgeon | ~87 | ▶ Critical thermal maximum when acclimated to 64.4<br>▶ Do not tolerate temperatures above 77 for any extended period of time | <66.2 | Juvenile | Geist et al. 2005; Israel et al. 2009; Rodgers et al. 2018b |
| | 86 | Found to oversummer in the San Joaquin River | 59–71 | Adult | Faukner and Jackson 2014; Heironimus and Jackson 2017 |
| **Prey Resources** | | | | | |
| Benthos | 86–104 | Lethality | Variable, within 86–104 | Juvenile/adult | Pennak 1978 |
| Phytoplankton | 104 | Lethality | Variable, within 86–104 | Juvenile/adult | Pennak 1978 |
| Western mosquitofish | >86–107 | Even when water temperatures averaged 91–95 and reached a maximum of 98, the fish were able to reproduce rapidly | 77–82 | Juvenile/adult | Cech et al. 1985; Offill and Walton 1999; University of California, Davis 2017b |
| Zooplankton | 86–104 | Lethality | Variable, within 86–104 | Juvenile/adult | Pennak 1978 |

1 There is no literature available on the thermal tolerance of migrating adult green sturgeon. Temperature tolerances and preferences for adult white sturgeon can be used as a surrogate.

2 Based on populations that live in Clear Lake, California.

3 The life history of western river lamprey has not been studied in California, so it is assumed that the thermal tolerance is similar to that of the Pacific lamprey (CDFG 2010b; PLTW 2017).

4 Juveniles tend to have higher preferenda for water temperatures than adults (Moyle and Knight 1984).

## SPECIAL-STATUS FISH SPECIES

Special-status fish species are defined as species that are legally protected or that are otherwise considered sensitive by federal, state, or local resource agencies. Special-status species include species or subspecies that are:

- officially listed by California under CESA or the federal government under the ESA as endangered, threatened, or rare;
- a candidate for state or federal listing as endangered, threatened, or rare;
- a taxon (i.e., taxonomic category or group) that meets the criteria for listing, even if not currently included on any list, as described CCR Section 15380 (State CEQA Guidelines);
- identified by CDFW as a species of special concern;
- afforded protection under local planning documents; or
- considered by CDFW to be rare, threatened, or endangered in California.

This section provides an overview of the life history and distribution of special-status fish species occurring within the affected environment of the San Joaquin River and downstream Delta waters. Figure 3.4-1 shows the temporal occurrence of special-status species in the lower reach of the San Joaquin River.

### Chinook Salmon

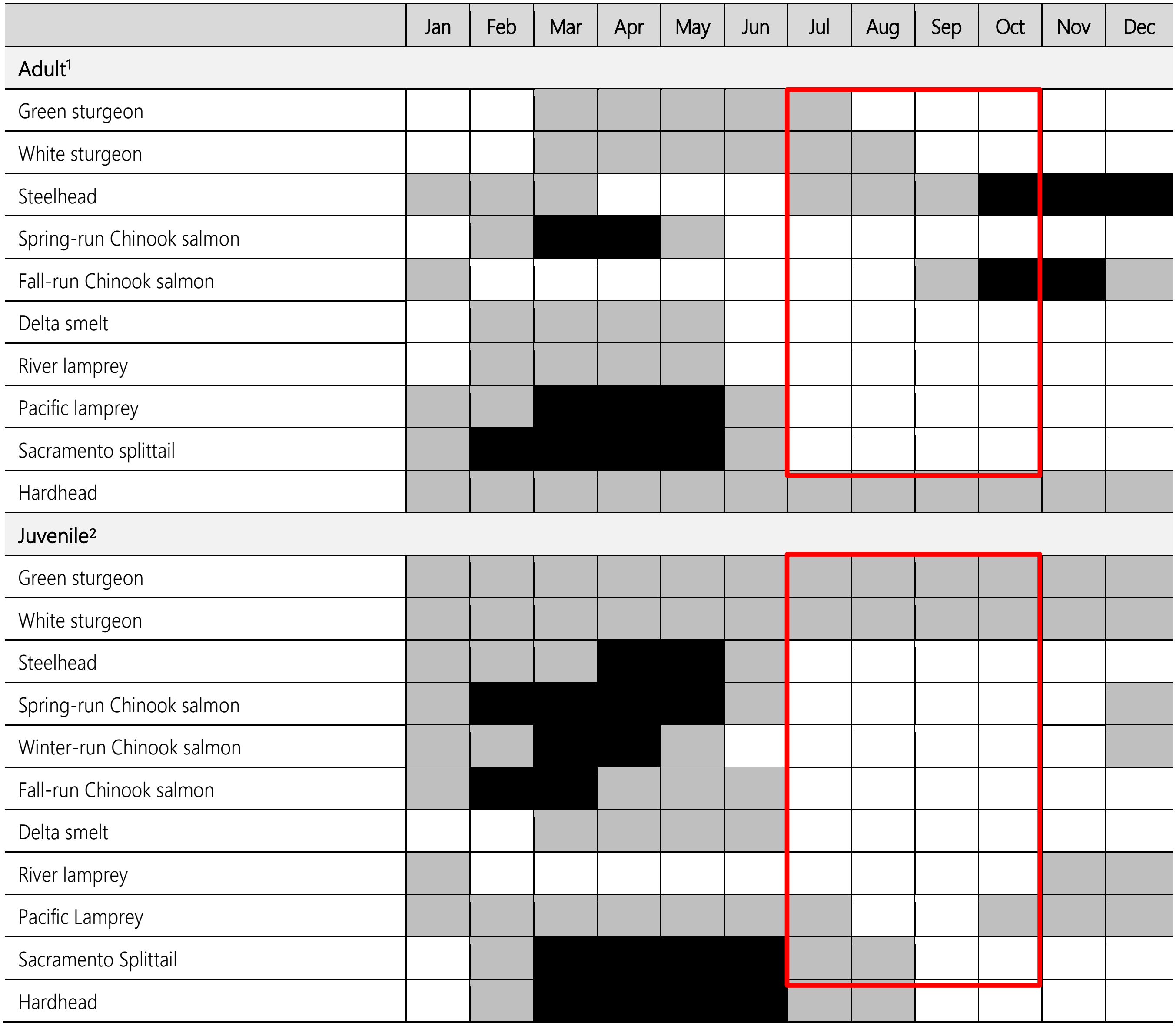
Chinook salmon use the Delta as a migration corridor for adults moving to upstream spawning tributaries, and for downstream-emigrating juveniles. No spawning or early life stage development (i.e., egg incubation, early rearing) occurs in the affected area. Specific information is provided below regarding the evolutionarily significant units (ESUs)[1] of Chinook salmon that may rely on the San Joaquin River and Delta areas affected by the proposed project.

#### Central Valley Spring-Run Chinook Salmon ESU

The Central Valley spring-run Chinook salmon ESU was listed as threatened under CESA in February 1999, and under the ESA on September 16, 1999 (50 Code of Federal Regulations [CFR] 50394). The Central Valley spring-run ESU includes all spawning populations in the Sacramento River and its tributaries, including the Feather River, and one artificial propagation program, the Feather River Hatchery spring-run Chinook program. Historically, spring-run Chinook salmon were abundant throughout the Sacramento and San Joaquin River systems but have been extirpated from the San Joaquin River system. In the San Joaquin River watershed, historic runs were reported in the San Joaquin, Stanislaus, Tuolumne, and Merced Rivers (Moyle 2002). Naturally spawning populations of spring-run Chinook salmon are currently believed to be restricted to accessible reaches of the upper Sacramento River, Antelope Creek, Battle Creek, Beegum Creek, Big Chico Creek, Butte Creek, Clear Creek, Deer Creek, Mill Creek, the Feather River, and the Yuba River (CDFG 1998). Restoration of the Central Valley spring-run Chinook population into the San Joaquin River basin is a goal of the San Joaquin River Restoration Program (SJRRP), which is currently underway. The SJRRP covers 153 miles of the San Joaquin River from Friant Dam to the mouth of the Merced River. Restoration consists of increased flows throughout the entire reach, including approximately 60 miles that are typically dry, and significant channel and fish passage improvements.

Adult spring-run Chinook salmon may be present in the San Joaquin River from February through May. Juvenile spring-run Chinook salmon may be present in the San Joaquin River from January through June (Figure 3.4-1). (Note: the red box indicates the period when project in-water construction would occur within the San Joaquin River.)

[1] An evolutionarily significant unit, or ESU, of Pacific salmon is considered to be a "distinct population segment" and thus a "species" under the Endangered Species Act.




1 There are no records of adult winter-run Chinook salmon or adult late fall-run Chinook salmon within the San Joaquin River basin. Therefore, adult winter-run and late fall-run Chinook salmon would not be present at any time of the year in the lower reach of the San Joaquin River. There are also no records of adult longfin smelt in the lower reach of the San Joaquin River.

2 Juvenile represents post emergent fry, fry, juveniles and smolts. There are no records of juvenile longfin smelt in the lower reach of the San Joaquin River.

Notes:

The red box indicates the period when in-water construction would occur within the San Joaquin River.

The gray cells indicate that the species would potentially be present during those months.

The black cells indicate peak abundance of the species during those months.

Sources: Moyle 2002; Hanni et al. 2006; NMFS 2014, 2010; CDFW 2019; Stuart, pers. comm., 2020; USFWS 2019; Damon et al. 2016; Kimmerer 2008; Nobriga et al. 2008

## Figure 3.4-1 Temporal Occurrences of Special-Status Fish Species in the Lower Reach of the San Joaquin River

### Sacramento River Winter-Run Chinook Salmon ESU

The Sacramento River winter-run Chinook salmon ESU was originally listed as an endangered species under the ESA on January 4, 1994 (59 *Federal Register* [FR] 440), and the endangered status designation was reaffirmed on June 28, 2005 (70 FR 37160). The ESU includes all naturally spawned populations of winter-run Chinook salmon in the Sacramento River and its tributaries, as well as fish from two artificial propagation programs: (1) winter-run Chinook salmon from the Livingston Stone National Fish Hatchery and (2) winter-run Chinook salmon in a captive broodstock program maintained at Livingston Stone National Fish Hatchery and the University of California Bodega Marine Laboratory.

Adults in this ESU spawn only within the Sacramento River basin and do not use the project area as part of their immigration route to spawning habitats. Based on the USFWS database of wire coded tags implanted into hatchery salmon, there is no record of adults in this ESU within the San Joaquin Basin. However, juveniles in this ESU rear in the San Joaquin River in the project area from December through May, based on real-time monitoring surveys conducted at Mossdale (Figure 3.4-1).

### Central Valley Fall/Late Fall-Run Chinook Salmon

The fall run of Chinook salmon is currently the largest run of Chinook salmon in the San Joaquin and Sacramento River watersheds. Because fall-run Chinook salmon represent the greatest proportion of all four runs, they continue to support commercial and recreational fisheries of significant economic importance. Fall-run Chinook salmon historically spawned in the mainstem San Joaquin River, and all other tributaries upstream of the Merced River. However, dam construction has restricted access to all upper tributaries, and water diversions dewatered much of the mainstem San Joaquin River, thus limiting fall-run Chinook salmon to the Merced, Tuolumne, and Stanislaus Rivers where they currently spawn and rear downstream from the dams. A late-fall run of Chinook salmon has not historically occurred in the San Joaquin River; however, some juvenile late-fall run Chinook salmon may occasionally use the San Joaquin River.

In general, adult fall-run Chinook salmon migrate into the Delta, San Joaquin River, and Sacramento River and upstream tributaries from September through December, with immigration peaking in October and November (Figure 3.4-1). Spawning generally occurs from October through December, with fry emergence typically beginning in late December and January. Fall-run Chinook salmon emigrate as postemergent fry, juveniles, and as smolts after rearing in their natal streams for up to 6 months. Consequently, fall-run emigrants may be present in the San Joaquin River from January through June, with peak emigration occurring between February and March (Figure 3.4-1). Emigrating juveniles remain in the Delta for variable lengths of time prior to entering the ocean.

### Chinook Salmon Thermal Tolerances

Available information for Chinook salmon indicates that, despite being a coldwater species, the species have relatively wide thermal tolerances and that, like most fish species, their upper temperature threshold tolerance increases in response to increasing acclimation temperatures. Many thermal tolerance studies are focused on Chinook salmon as a species; thus, the thermal tolerance discussion below addresses the species of Chinook salmon instead of only fall-run Chinook salmon.

Optimal temperatures for adult migration are considered 50–68°F and temperatures greater than 75.2°F are sometimes lethal with extended exposure duration (McCullough 1999; Williams 2006). However, adult Chinook salmon have been shown to migrate through river reaches having temperatures of 77°F, and even slightly higher when properly acclimated, with no observable effect on immigration (e.g., McCullough 1999, Moyle 2002). The aerobic capacity of fall-run juvenile Chinook salmon from the Mokelumne River Hatchery was unaffected at 73.4°F (Poletto et al. 2017) and juvenile spring-run Chinook salmon acclimated to conditions in the San Joaquin River (i.e., temperatures of 54–58°F) successfully performed swimming trials at 75.2°F (Lehman et al. 2017). When acclimated to warmer ambient temperatures (i.e., 65–73ºF) juvenile fall-run Chinook salmon from the Sacramento River can withstand short durations of elevated temperatures above 83ºF (Orsi 1971, cited in Boles 1988). A recent laboratory study on hatchery juvenile fall-run Chinook salmon from the Mokelumne River Hatchery found the fish were able to maintain physiological performance from 53.6–77°F (Poletto et al. 2017).

In terms of predation, studies have shown that exposure to short-term temperature increases does not lead to increased predation rates of juvenile Chinook salmon. For example, juvenile Chinook salmon collected from the

Columbia River showed no vulnerability to predation after being acclimated to 53.6°F and then exposed to 78.8°F (a 25.2°F temperature differential) for up to 120 minutes (Mesa et al. 2002).

## Central Valley Steelhead Distinct Population Segment

The Central Valley steelhead distinct population segment (DPS) was listed as threatened under the ESA on March 19, 1998 (63 FR 13347). Steelhead, the anadromous form of rainbow trout, were once abundant in California coastal and Central Valley drainages from the Mexican to Oregon borders. Existing wild steelhead stocks in the Central Valley are now mostly confined to the upper Sacramento River and its tributaries (McEwan and Jackson 1996). Populations have declined substantially in recent years as a result of habitat loss stemming from dam construction.

The biological assessment prepared for the SJRRP indicates that only limited data from CDFW midwater trawling samples collected on the lower San Joaquin River at Mossdale are available to estimate steelhead numbers in the San Joaquin River Basin. The limited data do suggest that steelhead numbers declined in the early 1990s and remained low through 2002 (U.S. Bureau of Reclamation 2011). Steelhead were generally believed to be extirpated from some of the San Joaquin River tributaries; however, monitoring conducted in the Mokelumne, Calaveras, Tuolumne, and Merced river systems over the past decade have determined that some steelhead production occurs in some years in each of these river systems. Steelhead smolts have been detected in the San Joaquin River every year since routine trapping began in 1995, indicating that the San Joaquin River watershed currently supports a small, but self-sustaining population of steelhead. Although there have been recent restoration efforts in the San Joaquin River tributaries, steelhead populations have generally continued to decline, with overall low abundance and fluctuating return rates.

Adult steelhead, averaging 24 to 31 inches (600 to 800 millimeters) in length (Moyle et al. 1995), generally leave the ocean and begin upstream migration through the Delta and into the San Joaquin River and Sacramento River to spawning reaches in the upper tributaries from July through March (Figure 3.4-1). Spawning generally occurs from January through April (McEwan and Jackson 1996). Juvenile steelhead rear in their natal streams for 1–3 years prior to emigrating back to the Delta, primarily in March and April and extending through July. Unlike Chinook salmon, steelhead are iteroparous (able to spawn repeatedly), and may spawn for up to 4 consecutive years before dying; however, it is rare for steelhead to spawn more than twice (Busby et al. 1996). Although one-time spawners comprise the majority, Shapovalov and Taft (1954) reported that repeat spawners were relatively numerous (i.e., 17.2 percent) in California streams.

Like Chinook salmon, steelhead use the San Joaquin River in the vicinity of the CTF only as a migration corridor for adults moving upstream to spawn and for juveniles moving downstream to rearing areas. No steelhead spawning occurs in the lower San Joaquin River within the Delta. Steelhead do not emigrate as postemergent fry and, therefore, only adults or free-swimming juvenile emigrants occur in the San Joaquin River and Delta near the CTF. Adults may be present in the vicinity of the CTF from July through March, although they are less likely to be in the area during summer months. Juveniles may be present from January through May (Figure 3.4-1).

### Steelhead Thermal Tolerances

Like other salmonids, such as Chinook salmon, steelhead have a relatively wide thermal tolerance and their upper temperature threshold tolerance increases in response to increasing acclimation temperatures. In California studies, evidence suggests that steelhead have higher thermal tolerances than those from northern latitudes (Myrick and Cech 1998; Verhille et al. 2016).

No studies were identified that reported temperature threshold values for blockage or avoidance behavior for steelhead in rivers in the Central Valley of California. In a review of numerous studies, Washington State Department of Ecology (2002) concluded that daily average temperatures of 69.8–75.2°F are associated with avoidance behavior and migration blockage in adult steelhead in rivers located in the Pacific Northwest. However, as noted above none of the reviewed studies took place in the Central Valley of California, where ambient river temperatures often exceed the values cited in the review, especially in the early portion of the steelhead immigration period (i.e., July through September). Verhille et al. (2016), in their study of California's Tuolumne River adult and juvenile steelhead, determined their upper thermal performance limit to be greater than 77°F. Based on the thermal studies compiled for steelhead, lethal temperatures for chronic exposure periods are believed to be in the low 80°F range for adults when acclimated to higher temperatures (Table 3.4-2).

Juvenile Central Valley steelhead can be found in water with summer temperature ranging from 32–81°F (NMFS 2014). In a recent temperature study conducted by Verhille et al. (2016) on wild Tuolumne River juvenile *O. mykiss* (no distinction was made between resident and anadromous life history forms, but for permitting purposes the fish were considered to be from the Central Valley steelhead ESU), the upper thermal performance limit was found to occur above 77°F (Verhille et al. 2016). The same study found *O. mykiss* can maintain 95% of their peak aerobic capacity in temperatures up to 76.3°F (Verhille et al. 2016).

## Green Sturgeon

Green sturgeon are found in the lower reaches of large rivers from British Columbia south to the Delta. On April 7, 2006, NMFS proposed the southern DPS of green sturgeon, which includes all fish populations south of the Eel River, California, as threatened under the ESA (71 FR 17757). The agency determined that the northern DPS, which includes all populations north of the Eel River (inclusive), do not warrant listing. The designation of the southern DPS was based on information demonstrating: (1) the majority of spawning adults are concentrated into one spawning river (i.e., the Sacramento River), (2) existence of continued threats that had not been adequately addressed since the previous green sturgeon status review, (3) downward trends in juvenile abundance, and (4) habitat loss in the upper Sacramento and Feather Rivers. The Final Rule establishing take prohibitions for the southern DPS was promulgated on June 2, 2010 (75 FR 30714).

Most adult fish, in preparation for spawning, follow a direct path to the Sacramento River when leaving the San Francisco Bay. However, a small percentage have been observed to move toward the eastern part of the Delta, following the San Joaquin River and subsequently enter the Sacramento River via the Mokelumne River and Delta Cross Channel (NMFS 2010). Until recently, the only evidence green sturgeon used the San Joaquin River, upstream of Stockton was from angler reporting via the Sturgeon Report Card. Angler report cards indicate zero to two green sturgeon were caught annually in the San Joaquin River, upstream of Stockton, since 2013 (Dubois et al. 2014; Dubois and Harris 2015, 2016; Dubois and Danos 2017, 2018). Although angler report card findings cannot be confirmed, adult green sturgeon presence was recently confirmed with a video camera and environmental DNA near Knights Ferry, California in the Stanislaus River, a tributary to the San Joaquin River (Anderson et al. 2018). The timing of the fish observation suggests it was not part of a reproductive migration. Nevertheless, further research is needed to determine the extent green sturgeon use the San Joaquin River as a migratory pathway (Gruber et al. 2012; Jackson and Van Eenennaam 2013; Anderson et al. 2018).

Juvenile green sturgeon are believed to reside in freshwater habitats from 1 to 4 years, before emigrating to the Delta under winter high-flow events; however, the timing of emigration is unknown (EPIC et al. 2001). Juvenile green sturgeon can be present in the Delta (including the San Joaquin River) during all months of the year (Figure 3.4-1). Adult green sturgeon may be present in the San Joaquin River from March through July (Figure 3.4-1).

### Green Sturgeon Thermal Tolerances

Relatively little information is available in the scientific literature pertaining to the thermal tolerances of different life stages of green sturgeon. In fact, no studies were found that addressed river temperatures that will block or delay upstream sturgeon immigration. However, two studies were found where adult white sturgeon were implanted with acoustic transmitters and tracked through their over-summering period in the San Joaquin River. River temperatures were obtained for the same period which showed that these adult white sturgeon used river areas that reached temperatures of 80.6–86°F, and migrated elsewhere in the fall (Faukner and Jackson 2014; Heironimus and Jackson 2017). As a closely related species, it is assumed that adult green sturgeon also can tolerate extended exposure to temperatures in the low to mid 80°F range, when acclimated to warmer temperatures during summer months.

Allen et al. (2006) showed age-0 green sturgeon growth rates to be greater at water temperatures of 75.2°F compared to lower exposure temperatures. Sardella et al. (2008), Verhille et al. (2015), and Rodgers et al. (2018a) showed that when acclimated to water temperatures in the 50s and 60s, the critical thermal maximum temperature determined for juvenile green sturgeon was 86.7–94.1°F.

## White Sturgeon

White sturgeon (*A. transmontanus*), a California species of special concern, is the largest freshwater fish in North America (Israel et al. 2009). The fish are sometimes found in marine waters, but more typically they reside in large rivers and their associated estuaries such as the Delta. White sturgeon in the Sacramento–San Joaquin River system are the southernmost spawning population of the species.

Little is known about white sturgeon's use of the San Joaquin River; however, white sturgeon have been documented throughout the river system (Heironimus and Jackson 2017). Although white sturgeon spawn primarily in the mainstem of the Sacramento River upstream of Knights Landing, spawning has also been confirmed in the San Joaquin River (Jackson et al. 2016). Spawning, postspawning, and mature adult white sturgeon can occur in the lower San Joaquin River from March through August (Israel et al. 2009; Heironimus and Jackson 2017 and references within). Juvenile white sturgeon may be present in the lower San Joaquin River in all months of the year (Israel et al. 2009).

### White Sturgeon Thermal Tolerances

As described above for green sturgeon, white sturgeon adults have been observed to over summer in the San Joaquin River when temperatures were recorded between 80.6°–86°F (Faukner and Jackson 2014; Heironimus and Jackson 2017). Lee et al. (2016) showed white sturgeon juveniles acclimated to 65.5 ± 0.9°F had a critical thermal maximum of ~88–90.5°F depending on their feeding rates.

## Delta Smelt

USFWS listed delta smelt as a threatened species under the federal ESA in March 1993 (58 FR 12854). In early 2005, USFWS reviewed the population status of this species and, based on 37 years of data, recommended that no change in its threatened status was warranted. The delta smelt also was listed as threatened under CESA in 1993, and redesignated by the state as endangered in 2008. On November 13, 2009, the Center for Biological Diversity filed separate lawsuits challenging USFWS's failure to respond to a petition to change the delta smelt's federal status from threatened to endangered, and USFWS's denial of federal listing for the longfin smelt. On April 2, 2010, USFWS issued a finding that relisting delta smelt as endangered was warranted but precluded by the need to devote resources to higher-priority matters.

Delta smelt are endemic to the Delta and historically were one of the most abundant fish found in the estuary, with a range extending from Suisun Bay upstream to the City of Sacramento. The current range extends from Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, and Yolo Counties; however, delta smelt may be carried to San Pablo Bay under high outflows, but have not established permanent populations there (Moyle 2002). Spawning adults and larvae have been found throughout the Delta, but they are typically most abundant in the northern, western, and central Delta (Bennett 2005). The range of delta smelt in the San Joaquin River extends south to the City of Lathrop (Moyle 2002; Merz et al. 2011; USFWS 2015, 2019).

Adult delta smelt migrate upstream in response to winter flow and turbidity increases and temperature decreases. The annual range of expansion of adult delta smelt extends up the San Joaquin River from Antioch to areas near Stockton (USFWS 2019). The San Joaquin River, near Lathrop, is located approximately 10 miles upstream of Stockton, however, for the sake of this assessment it is assumed that delta smelt may occur in the vicinity of the CTF outfall.

Adult delta smelt are almost never fully ripe and ready to spawn before February and most spawning is completed by May (Damon et al. 2016) (Figure 3.4-1). Spawning occurs in sloughs and shallow edge waters of channels (Moyle 2002). Eggs sink to the bottom and adhere to the substrate. Adult fish die after spawning. Eggs incubate for 10–14 days. In the first 6 days following hatching, delta smelt larvae swim continuously and are positively phototactic (i.e., move in response to light) (Bennett 2005). By approximately 25–40 days posthatching, their swim bladders are developed, and fin-folds begin to appear (Bennett 2005) and their ability to swim and maintain a preferred depth in the water column is improved. Delta smelt larvae are transported downstream by river currents to zones of freshwater/saltwater mixing from late March through July (Wang 1986; DWR and Reclamation 1994). While in freshwater, delta smelt postlarvae (i.e., 14–20 millimeters [0.6–0.8 inch] in length and 25–40 days posthatching) may be distributed at different depths throughout the water column. Postlarval delta smelt make vertical migrations in the water column potentially in response to tidal cycles, time of day (i.e., day and night), and food availability; however, the mechanisms affecting these movements are not understood (Bennett 2005).

Delta smelt larvae primarily feed on copepods, particularly the early life stages of copepods (USFWS 2019). Juvenile Delta smelt also have copepod-dominated diets, but these larger individuals tend to eat adult copepods and also begin to include prey taxa in their diets that grow larger than copepods, such as amphipods (USFWS 2019). Adult Delta smelt continue to prey on copepods but have less reliance on them and greater diet diversity (USFWS 2019).

In general, the southern Delta has several habitat attributes that are not appropriate for delta smelt use including; too much coverage by submerged plants, low turbidity, and warm summer water temperatures (USFWS 2019). Although it is possible for adults to spawn in the southern Delta, the 2019 state of scientific understanding indicates that most adult fish aggregate around Grizzly Island, Sherman Island, and in the Cache Slough Complex. Based on their preference for shallow and cold water gravel or sand habitat for spawning (USFWS 2019), delta smelt would not be expected to spawn in or around the CTF effluent discharge thermal plume; however, limited spawning could potentially occur in the vicinity of the proposed project (USFWS 2015, 2019). Because delta smelt eggs adhere to the substrate, eggs spawned in the San Joaquin River upstream of the CTF site would not be expected to drift downstream past the effluent discharge outfall. Adult delta smelt could be present in the project area from February through May. Delta smelt larvae have the potential to drift downstream past the CTF effluent outfall from late March through June (Figure 3.4-1).

Kimmerer (2008) showed that delta smelt no longer occupied the south Delta during July and August and Nobriga et al. (2008) stated that habitat changes in the central and south Delta have rendered it seasonally unsuitable to delta smelt during the summer. Therefore, adult delta smelt could be present in the project area from February through May and delta smelt larvae have the potential to drift downstream past the CTF effluent outfall from late March through June (Figure 3.4-1).

#### Delta Smelt Thermal Tolerances

The thermal tolerance ranges for delta smelt vary with life stage and acclimation temperatures and the majority of information regarding their thermal tolerances is derived from laboratory studies and inferences made from temperatures recorded at the time of field surveys. Bennett (2005) reports that, based on monitoring studies, wild delta smelt are most abundant when temperatures are less than 72°F, with greater than 90 percent of delta smelt catches occurring at temperatures less than 68°F. Further, delta smelt spawning success is also sharply decreased at temperatures above 68°F and spawning is generally limited to temperatures between 59 and 68°F in laboratory studies (Bennett 2005). Swanson et al. (2000) reported a critical thermal maximum of 77.7°F for adult delta smelt. However, delta smelt have been found in waters up to 82.4°F (Moyle 2002; Swanson and Cech 1995; Swanson et al. 2000; Jeffries et al. 2016). While temperatures at the upper end of their range of tolerance is a suboptimal condition that may have other long-term adverse effects, the fact that delta smelt are found in the wild at these temperatures indicates that they can survive short-term exposures to temperatures up to 82.4°F.

### Longfin Smelt

The longfin smelt, first petitioned for listing under CESA in August 2007, was listed as threatened under CESA on March 5, 2009, because of apparent long-term declines in abundance. On April 2, 2012, USFWS released its 12-month Finding on a Petition to List the San Francisco Bay-Delta Population of the Longfin Smelt as Endangered or Threatened. USFWS determined that the listing of the Bay-Delta DPS of longfin smelt is warranted; however, the listing is precluded by higher-priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants. This finding means that the longfin smelt DPS was added to the list of candidates for ESA listing, where its status will be reviewed annually. The primary cause of decline of longfin smelt in San Francisco Bay is reduction in outflows associated with water exports from state and federal pumping operations, especially during periods of drought (Moyle 2002). Other factors cited as contributing to decline of longfin smelt include entrainment losses to diversions, extreme climatic variation, toxic substances (especially pesticides), predation, and competition from introduced species (Moyle 2002).

Longfin smelt are relatively short lived, reaching maturity at age 2. The majority of individuals live only 2 years, but some may live as long as 3 years. Spawning occurs in fresh water, over substrates composed of sand and/or gravel, rocks, and aquatic plants, and may occur from November into June, with peak spawning activity occurring from February through April (Emmett et al. 1991; Wang 1986). Spawning occurs mainly downstream of about Rio Vista in the Sacramento River, and below Medford Island in the San Joaquin River, with a downstream boundary near Pittsburg and Montezuma Slough (Merz et al. 2013).

The Delta supports the largest population of longfin smelt in California, but their range also extends into San Pablo Bay, San Francisco Bay, South San Francisco Bay, and the Gulf of the Farallones. Longfin smelt are found in areas ranging in salinity from almost pure seawater (35 parts per thousand) upstream to areas of pure fresh water. Distribution of longfin smelt is centered in the west Delta, Suisun Bay, and San Pablo Bay. In wet years, they may be distributed more toward San Pablo Bay, and in dry years more toward the west Delta. Longfin smelt are rarely found in the lower San Joaquin River as far east as Stockton, and thus are not considered a member of the fish community in the vicinity of the CTF.

#### Longfin Smelt Thermal Tolerance

Adult longfin smelt prefer water temperatures of about 64 to 68°F or below but will occupy waters as warm as 72°F in the summer, with few fish found in waters above 76°F (CDFG 2009). Temperatures come close to or exceed this upper limit in the summer and early fall in the Delta. Moyle (2002) suggests that longfin smelt use of deepwater habitat, and marine migrations in the summer may be a method of escaping higher temperatures.

### Pacific Lamprey

The Pacific lamprey is a federal species of concern; however, no state designation has been made. Pacific lamprey are still present throughout much of their historical range. However, some populations have been reduced or extirpated from streams that have been highly degraded or modified by humans. The Pacific lamprey range includes Pacific coast drainages extending from Hokkaido Island, Japan to Alaska and south to Rio Santo Domingo, California (Moyle 2002) and includes rivers and creeks of the Central Valley, California. Pacific lamprey are anadromous and highly predaceous (Moyle 2002). The predatory adult stage is spent in the ocean, although some scattered landlocked populations occur in some freshwater reservoirs.

The adults begin their upstream spawning migrations to freshwater rivers as early as January, with peak immigration occurring from early March through late June (Moyle 2002). Spawning occurs shortly after the adult lamprey reach suitable spawning areas, primarily during the spring and summer months. Following hatching, the ammocoetes reside in upstream waters for a period of 5–7 years, where they burrow into the sediments and filter organic matter, before undergoing metamorphosis to the predatory and saltwater-tolerant adult phase and subsequent emigration from freshwater to the ocean. Emigration occurs under high flows during the winter and spring, possibly coincident with the upstream migration of the adults (Moyle 2002). Based on the available information, adult Pacific lamprey may be present in the lower San Joaquin River during their spawning migrations as early as January, but primarily between March and May, potentially as late as June. Juvenile Pacific lamprey may occur between October and July (Hanni et al. 2006) (Table 3.4-1).

### River Lamprey

The river lamprey is a California species of special concern. The river lamprey is relatively small (averaging 6.7 inches [17 centimeters]) and highly predaceous (Moyle 2002). They are anadromous and will attack fish in both fresh and salt water (Moyle 2002). The river lamprey is distributed in streams and rivers along the eastern Pacific Ocean from Juneau, Alaska, to the San Francisco Bay. Primary abundance in California is in the lower Sacramento River and San Joaquin River watersheds, especially the Stanislaus and Tuolumne Rivers.

A great deal of what is known about the river lamprey is from information on populations in British Columbia. There, adults migrate from the Pacific Ocean into rivers and streams in the fall and spawn from February through May. Adults will excavate a saucer-shaped depression in sand or gravel riffles where the eggs are deposited. After spawning, the adults perish. Ammocoetes remain in backwaters for several years, where they feed on algae and microorganisms (Moyle et al. 1995). The metamorphosis from juvenile to adulthood begins in July and is complete by the following April. Following completion of metamorphosis, river lamprey congregate immediately upriver from salt water and emigrate into the ocean in late spring (Moyle 2002). Based on this life history, adult river lamprey may occur in the lower San Joaquin River from February through May, and juvenile river lamprey may occur between late November and January (Hanni et al. 2006) (Figure 3.4-1).

#### Pacific and River Lamprey Thermal Tolerance

The acute thermal tolerances of Pacific and river lamprey are relatively unknown at this time, especially for lamprey populations native to the Sacramento River. Anecdotal evidence from populations residing in Idaho waterways suggests that juvenile Pacific lamprey can survive diurnal stream temperatures in excess of 77ºF. Annual instream temperatures of the Potlatch River (Idaho), where healthy pacific lamprey ammocoetes were collected in 1981, ranged from 33.8–77ºF (Mallatt 1983). Likewise, Pacific lamprey ammocoetes resided in reaches of the Red River (Idaho), which reached or exceeded 80.1ºF during the summer months (Claire 2004).

### Sacramento Splittail

The Sacramento splittail, a California species of special concern, is an endemic cyprinid (i.e., minnow) that was once widely distributed in lakes and rivers throughout the Central Valley, including the Sacramento River upstream to Redding and in the American River as far east as Folsom (Moyle 2002). Its present range in the San Joaquin River system includes the San Joaquin River upstream to the Tuolumne River near Modesto (Moyle 2002).

Adult splittail usually reach sexual maturity in their second year. Upon reaching maturity, they migrate upstream to spawn from January through July, with peak migration occurring from February through May (Moyle 2002). Spawning occurs from midwinter through July in water temperatures between 48–68°F (Wang 1986) at times of high winter or spring runoff (Moyle et al. 1995). Eggs acquire adhesive properties following exposure to water and adhere to vegetation or other benthic substrates (Wang 1986). Fertilized eggs generally hatch in 3–5 days, and larvae begin feeding on plankton soon thereafter. Juvenile splittail inhabit shallow areas with abundant vegetation that are devoid of strong currents (Wang 1986) as they travel downstream from the spawning grounds to the Delta. Emigration through the lower San Joaquin River may occur from February through August, with peak emigration occurring from March through June.

Splittail spawning could occur in the lower San Joaquin River; however, there is minimal shallow and vegetated habitat in the vicinity of the CTF and, therefore, very little potential for fertilized splittail eggs to be present near, or drift past the CTF effluent discharge. Adult splittail may occur from January through May and juveniles may occur from February through July (Figure 3.4-1).

#### Sacramento Splittail Thermal Tolerance

Splittail are considered a warm water fish (Wang 1986). Laboratory studies have shown that adult splittail are remarkably tolerant of elevated temperatures up to 84.2°F for 120 minutes when acclimated to 62.6°F (Young and Cech 1996). Juvenile Sacramento splittail had a loss of equilibrium at 91.4°F after 130 minutes when acclimated to temperatures of 68°F (Young and Cech 1996).

### Hardhead

Hardhead, a California species of special concern, are large warmwater cyprinids (i.e., minnows) that occur primarily in large, undisturbed low to midelevation rivers and streams, including the upper tributaries of the San Joaquin River (Moyle 2002). Hardhead mature in their third year and spawn primarily in April and May, although some data suggest that spawning may extend into August (Moyle 2002). Hardhead in large rivers, such as the San Joaquin River, typically migrate into smaller tributary streams to spawn, where habitat conditions are more suitable for spawning (Moyle 2002). Although the early life history of juvenile hardhead is poorly understood, juvenile hardhead move into deeper habitats as they grow (Moyle 2002). Adult and juvenile hardhead have the potential to occur year-round in the lower San Joaquin River in the vicinity of the CTF site. However, based on their preference for the midlevel tributaries of the San Joaquin basin, adults, juveniles, and eggs or newly hatched larvae are unlikely to occur in the lower San Joaquin River near the CTF site and, therefore, are not expected to be exposed to CTF effluent discharge effects.

Hardhead Thermal Tolerance

Most of the streams in which hardhead occur have summer temperatures exceeding 68ºF, and optimal temperatures appear to be 75 to 82ºF (Moyle 2002).

## PHYTOPLANKTON

Phytoplankton are the dominant primary producers within freshwaters, and thus are also an important component to the San Joaquin River's food web. Phytoplankton production has a critical role in nutrient cycling and aquatic food webs and make up a substantial proportion of the primary production in aquatic ecosystems (Dawes 1998). Phytoplankton growth and productivity are affected by several factors, including light, temperature, circulation, grazing, and nutrients (Cloern et al. 2014). Water temperature affects phytoplankton cell division and carbon fixation rates (Berges et al. 2002) and cell division rates increase with increasing temperature (Goldman and Carpenter 1974). These increasing division rates are species-specific as some taxa are more influenced by temperatures than others.

Langford (1990) concluded short-term exposures to temperatures below 95°F do not cause significant damage to entrained freshwater phytoplankton. However, long-term exposure to such temperatures is potentially harmful. At temperatures of 104°F and above, even short-term exposures may be lethal (Langford 1990). Rajadurai et al. (2005) concluded that the growth rate of a diatom, *Amphora coffeaeformis*, cultured in 82.4°F waters was not significantly affected by temperature shock to 107.6°F for up to 45 minutes and a second diatom, *Chaetoceros wighami*, also cultured at 82.4°F had a minimal reduction in growth when subjected to 107.6°F for 15 (97 percent of control growth), 30 minutes (94 percent of control growth), and 45 minutes (89 percent of control growth). Finally, in a review of growth rates of algae, Eppley (1972) concluded that there is a gradual and exponential increase in growth up to approximately 104°F.

## ZOOPLANKTON

Zooplankton play an essential role in pelagic food chains and aquatic ecosystems as an important link between primary and tertiary trophic levels. Zooplankton provide important food for fish and invertebrate predators and they graze on algae, bacteria, protozoa, and other invertebrates (U.S. Environmental Protection Agency 2020).

Most freshwater invertebrates, including zooplankton, are tolerant of high temperatures. The lethal temperature threshold for most freshwater invertebrates occurs from 86–104°F (Pennak 1978). For example, a water flea (*Daphnia magna*) cultured at 68°F had a LD50 value (i.e., the temperature that resulted in lethality to 50 percent of experimental organisms) of 94.6°F when subjected to an acute 24-hour heat exposure and 100.0°F following a thermal shock for 15 minutes (Kivivuori and Lahdes 1996).

It is generally known that copepods are able to reduce their metabolic rate and enter diapause under harsh environmental conditions. Adaptations such a diapause result in an ability to live at sustained temperatures in excess 82.4°F (Thorp and Covich 1991). Two cladocerans, *Ceriodaphnia* and *Diaphanosoma*, inhabit waters with temperatures of 80.6–86°F (Thorp and Covich 1991). Furthermore, reproduction of some rotifers (e.g., Brachionus species) can continue successfully in water temperatures of 104°F (Thorp and Covich 1991). The range of water temperatures that occur seasonally in the San Joaquin River are within the suitable range for supporting the river's zooplankton community.

## BENTHIC MACROINVERTEBRATES

No known BMI data are available in the immediate vicinity of the proposed project; however, a BMI survey was conducted approximately 10 miles downstream of the project site to evaluate the BMI community structure within the mainstem of the San Joaquin River (Robertson-Bryan, Inc. 2013a). Results from this study can be used as a surrogate to describe the BMI community in the project area as this lower reach of the San Joaquin River is characterized by fine sediments and sand, lack of structure, and low habitat diversity. Sampling results from the Robertson-Bryan, Inc. (2013a) study indicated that the lower San Joaquin River supports a BMI community adapted to such conditions (e.g., highly mobile and unstable substrates, general lack of structure, low habitat diversity). Over 90 percent of the BMI taxa identified as present were dominated by two functional feeding groups, the collector-filterers and collector-gatherers, which are composed of species that consume fine particulate organic matter (Robertson-Bryan, Inc. 2013a). The metric scores for BMI community tolerance indicate that the BMI community in the study reach is dominated by taxa that are moderately to highly tolerant of degraded conditions, and devoid of taxa that are intolerant of such conditions.

Many of the benthos taxa occurring in the San Joaquin River are found commonly throughout valley floor warmwater bodies of the Central Valley. Most freshwater invertebrates are tolerant of high temperatures, with the lethal temperatures generally ranging from 86 to 104°F (Pennak 1978). Benthic organisms can acclimate to changes in temperature and taxa, including those that are considered intolerant to mildly tolerant of environmental perturbation, and are generally resistant to short-term, rapid changes in temperature.

## CRITICAL HABITAT AND ESSENTIAL FISH HABITAT

### Central Valley Spring-Run Chinook Salmon ESU

Critical habitat for the Central Valley spring-run Chinook salmon ESU, designated September 2, 2005 (50 CFR 52488), includes 12 hydrologic units. The critical habitat designation includes water bodies in Tehama, Butte, Glenn, Shasta, Yolo, Sacramento, Solano, Colusa, Yuba, Sutter, Trinity, Alameda, San Joaquin, and Contra Costa Counties. The critical habitat includes the Suisun, San Pablo, and north San Francisco Bays, and Delta estuarine habitat including the north Delta; however, the central and south Delta were excluded. Therefore, the project site is not located within designated critical habitat for the Central Valley spring-run Chinook salmon ESU.

### Sacramento River Winter-Run Chinook Salmon ESU

Critical habitat for the winter-run Chinook salmon ESU, designated on June 16, 1993 (58 FR 33212), is defined as the Sacramento River from Keswick Dam (River Mile 302) to Chipps Island (River Mile 0) at the westward margin of the Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay westward of the Carquinez Bridge; and all waters of San Francisco Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge. Because the central and south Delta and lower San Joaquin River were excluded from the critical habitat designation, the project site is not located within designated critical habitat for the Central Valley winter-run Chinook salmon ESU.

### Central Valley Steelhead DPS

Critical habitat for the Central Valley steelhead DPS, designated September 2, 2005 (50 CFR 52488), includes 21 hydrologic units. The critical habitat designation for Central Valley steelhead includes water bodies located in Tehama, Butte, Glenn, Shasta, Yolo, Sacramento, Solano, Yuba, Sutter, Placer, Calaveras, San Joaquin, Stanislaus, Tuolumne, Merced, Alameda, and Contra Costa Counties. Therefore, the project site is located within critical habitat designated for the Central Valley steelhead DPS.

### Southern DPS of Green Sturgeon

Critical habitat for the southern DPS of green sturgeon was designated by NMFS on October 9, 2009 (50 CFR 226). In freshwater, critical habitat includes the mainstem Sacramento River downstream of Keswick Dam (including the Yolo and Sutter bypasses), the Feather River below Fish Barrier Dam, the Yuba River below Daguerre Point Dam, and the Delta. In saltwater, the critical habitat designation includes Coastal U.S. marine waters within 60 fathoms depth from Monterey Bay, California (including Monterey Bay), north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its U.S. boundary; the Suisun, San Pablo, and San Francisco Bays in California; the lower Columbia River estuary; and certain coastal bays and estuaries in California (e.g., Humboldt Bay), Oregon, and Washington. The project site is located within the Delta and thus is within the critical habitat designated for the southern DPS of green sturgeon.

### Delta Smelt

Critical habitat for delta smelt was designated on December 19, 1994 (59 FR 65256). Critical habitat for delta smelt includes all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in Suisun Bay, including the contiguous Grizzly and Honker Bays; the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma sloughs; and the existing contiguous water contained within the legal boundaries of the Delta, as defined in Section 12220 of the California Water Code. Therefore, the project site is located within the designated critical habitat for delta smelt.

### Essential Fish Habitat

The San Joaquin River and Delta at the project site is located in the region identified as EFH for Pacific salmon, which includes the Sacramento River winter-run Chinook salmon ESU, the Central Valley spring-run Chinook salmon ESU, and Central Valley fall-/late fall-run Chinook salmon. Therefore, the project site is located within the area of designated EFH.

# 3.4.3 Environmental Impacts and Mitigation Measures

## ANALYSIS METHODOLOGY

Components of the proposed project that could affect aquatic biological resources within the affected environment are (1) construction of the effluent conveyance pipeline levee crossing and outfall structure within the San Joaquin River and (2) CTF effluent discharges to the river. Consequently, project impacts are organized by (1) construction-related impacts and (2) operation-related impacts, which involves the CTF effluent discharges to the river. Details on the methodology and assumptions used to evaluate these potential impacts are described in detail below. Potential impacts on the San Joaquin River water quality for constituents that would be affected by the proposed project, and the impacts of those water quality changes on beneficial uses, including aquatic biological resources, are addressed in Section 3.9, "Hydrology and Water Quality." Hence, the reader is referred to Section 3.9 for assessments of water quality–related impacts on aquatic biological uses.

### Construction-Related Effects

The following assumptions were considered when assessing construction-related impacts from aquatic resources. Construction of the levee pipeline crossing and outfall structure is expected to be limited to the July 1 through October 31. However, depending on hydrologic conditions and subject to compliance with species work windows defined by NMFS, a work window variance that allows an extension beyond October 31 may be granted, if needed. The Central Valley Flood Protection Board, NMFS and other agencies may stipulate that the City must comply with additional conditions and commitments as a component of any work window variance. Construction would occur from 7 a.m. to 5 p.m. on weekdays.

Aquatic biological resource impacts associated with construction activities were assessed in a qualitative manner. The potential construction-related impacts on fish, BMI, and plankton communities were assessed considering the aspects of the construction work involved that could affect these aquatic organisms, including the following factors:

- the fish species and life stages potentially occurring in the project area during construction;
- the timing, type, and degree of use of the San Joaquin River by special-status fish species;
- the ability of fish to avoid the construction area;
- the nature and degree of use of the affected areas by BMI and plankton communities, and the percentage of the overall river's BMI and plankton communities that would be exposed to the construction-affected areas;
- the geographic extent, nature, and duration of construction-related activities;

- conservation measures, construction best management practices, and actions required to meet terms stipulated in agency issued permits that would be implemented as part of the proposed project to avoid or minimize the effects of construction-related activities on the fish and their prey (i.e., BMI and plankton); and
- construction-related effects on water quality and physical habitat of the San Joaquin River.

## Operations-Related Effects

With the project in place, operations of the CTF would result in discharges of treated effluent to the San Joaquin River. Effects on water quality from project operations related to the long-term effects on the water quality of the San Joaquin River and downstream Delta locations that would occur from the new CTF effluent discharge to the river are addressed in Section 3.9, "Hydrology and Water Quality," of this EIR. Therefore, potential water quality–related impacts of the proposed project to beneficial uses, including aquatic life uses, are addressed in Section 3.9 and are not repeated here. This section addresses CTF operations-related effects on San Joaquin River water temperature, and how project-driven seasonal increases in river water temperatures would affect aquatic biological resources within the affected environment.

The Delta Simulation Model II (DSM2), developed by the California Department of Water Resources, was used to model river temperatures upon full mixing of the CTF effluent with river water, as well as to model river temperatures assuming no CTF discharge (i.e., existing conditions). In addition, separate modeling was conducted to characterize the thermal plume created by the CTF discharge near the outfall (prior to effluent fully mixing with river flows) using the U.S. Environmental Protection Agency–supported CORMIX model. The approach employed using each of these models is described in detail below.

### DSM2 Modeling (Fully Mixed River Temperatures)

The proposed location of CTF discharge into the San Joaquin River is tidally influenced, and occasionally experiences reverse flows at the outfall location, although such reverse flows do not occur in all years. When reverse flows do occur, discharged CTF effluent can be transported in the San Joaquin River downstream only to move back upstream past the outfall and back downstream again during each tidal cycle. With a continuous discharge occurring, portions of the river may receive multiple inputs of effluent. DSM2 simulates Delta hydrodynamics and the continuous discharge scenarios to provide output for river water temperature and CTF effluent fractions at specific locations defined in the model that accounts for this tidally driven multiple dosing of effluent that occurs during specific flow conditions. Thus, DSM2 was used to model effluent flow fractions and river temperatures upon effluent fully mixing with receiving waters at the outfall location and at other nodes (i.e., river locations) within DSM2 at which data can be output from the model. DSM2 modeling of the CTF discharge to the San Joaquin River was performed for discharge at ADWF rates of 2.5 mgd and 6.0 mgd (buildout of 5.2 mgd plus cumulative; see the discussion in Chapter 2, "Project Description" and Section 3.9, "Hydrology/Water Quality"). The period modeled by DSM2 was January 1, 2008 through December 31, 2016. This period was selected because climate, hydrologic, and Delta operations data necessary to run DSM2 are available and because it encompasses the 2012–2016 extended drought period, thus providing a basis for assessing the maximum potential effect of the CTF discharges on San Joaquin River water temperatures. Three scenarios were simulated, as follows:

- No Discharge: Historical data for the Delta with no CTF discharge.
- 2.5 mgd ADWF Discharge: Historical data for the Delta, and CTF effluent discharge rates associated with the plant's current 2.5 mgd ADWF treatment capacity.
- 6.0 mgd ADWF Discharge: Historical data for the Delta and CTF discharge rates associated with buildout of the Lathrop general plan, 5.2 mgd, plus cumulative development for a total discharge of 6.0 mgd ADWF.

For additional details on the DSM2 modeling performed and used for the temperature assessments, see Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Section 2.1.

### CORMIX Thermal Plume Modeling

CORMIX is a mixing zone model approved by the U.S. Environmental Protection Agency that simulates pollutant discharges into receiving water bodies. CORMIX was chosen to simulate the temperature plume in the river near the outfall, created by the CTF discharge, due to its ability to simulate heated discharges and their thermal effects on receiving water bodies. CORMIX is able to simulate three discharge types: single port discharges (CORMIX1), submerged multiport discharges (CORMIX2), and buoyant surface discharges (CORMIX3). The proposed CTF outfall is a submerged pipeline discharge; therefore, the CORMIX1 model for single port discharges was used to simulate the effluent discharge to the San Joaquin River.

CORMIX modeling of the CTF discharge to the San Joaquin River was performed for discharge rates of 2.5 mgd and 6.0 mgd ADWF discharge rates. For both the 2.5 mgd and 6.0 mgd ADWF discharge rates, plume modeling was performed for a worst-case and median-case effluent and river temperature and flow scenarios for each month of the year because they "book-end" the worst-case half of all plume conditions that could occur in the river. From an assessment standpoint, if no significant adverse thermal effects on fishes, plankton, or BMIs would occur for either the worst-case or median-case scenarios (i.e., the worst-case half of all possible plume conditions), then there would be no adverse effects caused by the best-case half of plume conditions, where thermal gradients across the plume are less than those modeled and assessed for the worst-case half of conditions.

Worst-case and median-case scenarios for the CORMIX modeling were defined as follows.

- Worst-case
  - 100th percentile effluent-river temperature differential. Temperature differential is defined as $\text{Effluent}_{\text{temp.}}$ minus $\text{River}_{\text{temp.}}$
  - 1.3 peaking factor multiplied by monthly average effluent flow rate, capped at 7.55 mgd (maximum discharge capacity of outfall conveyance pipeline) for the 6.0 mgd ADWF scenario
  - Slack-tide river velocity of 0.05 feet per second (fps) for all months
- Median-case
  - Median effluent-river temperature differential
  - Monthly average effluent flow rate corresponding to a 2.5 and 6.0 mgd ADWF
  - Median river velocity for each month

For additional details on the CORMIX modeling performed and used for the thermal plume assessments, see Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Section 2.2.

Based on the nature of thermal effects on the San Joaquin River that could potentially occur due to CTF discharges at rates of 2.5 and 6.0 mgd ADWF, the following potential thermal effects on fish and their prey species were assessed:

- blockage or significant delay of thermally sensitive, special-status adult fish immigrations due to the thermal effect of CTF discharges on fully-mixed river temperatures;
- mortality or chronic, adverse sublethal effects on special-status fish or their prey organisms (i.e., phytoplankton, zooplankton, or BMIs) due to the thermal effect of CTF discharges on the fully mixed river temperatures;
- blockage or significant delay of special-status adult fish migrations due to the thermal plume created by CTF discharges in the San Joaquin River near the outfall; and
- mortality or chronic, adverse sublethal effects on special-status fish or their prey organisms (i.e., phytoplankton, zooplankton, or BMIs) passing through the CTF's thermal plume in the San Joaquin River near the outfall.

As described in Chapter 2, "Project Description," the City intends to obtain an initial NPDES permit to discharge up to 2.5 mgd ADWF of CTF effluent to the San Joaquin River, which is the current ADWF treatment capacity of the CTF. However, the proposed effluent discharge pipeline and outfall would be designed to accommodate CTF flows that would be generated at City buildout. Currently, the projected CTF discharge rate for the buildout level of development that has been approved by the City is 5.2 mgd ADWF. However, if potential additional future development presently proposed in the City is ultimately approved by the City Council, the buildout CTF discharge rate would be approximately 6.0 mgd ADWF. Because cumulative projects in the City were under consideration at the time this analysis was performed, and because this EIR also assesses impacts of the proposed project under the future cumulative condition, the modeling conducted to support the water quality analysis assumed 2.5 and 6.0 mgd ADWF discharge rates. Modeling output for the 2.5 mgd ADWF discharge scenario supports assessment of near-term project-specific impacts under current CTF treatment capacity. Modeling output for the 6.0 mgd ADWF discharge scenario supports assessment of project-specific impacts associated with the discharge rate of 5.2 mgd ADWF and assessment of the future cumulative condition, which is projected to be 6.0 mgd ADWF. This approach provides for a conservative assessment of the proposed project at the currently projected and approved City buildout level of development and assesses the incremental contribution of reasonably foreseeable future cumulative development and its associated increase in wastewater discharge to the San Joaquin River.

## THRESHOLDS OF SIGNIFICANCE

An impact on aquatic biological resources would be significant if implementation of the proposed project would:

- have a substantial adverse effect (e.g., lethality or chronic, adverse sublethal effects such as reduced fecundity in adults or reduced growth or predation avoidance ability in juveniles), either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NMFS;
- interfere substantially with the movement of any native resident or migratory fish species or with established migratory corridors or nursery sites;
- have the potential to substantially reduce the amount of usable aquatic habitat within the affected environment, or result in adverse changes to designated critical habitat for federal ESA-listed species that would reduce the quantity or value of such habitat to the listed species;
- result in physical, chemical, or biological conditions that would cause substantial reductions in non-special-status fish populations or abundance of phytoplankton, zooplankton or BMIs;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW, USFWS, or NMFS; or
- conflict with the provisions of an adopted habitat conservation plan; natural community conservation plan; or other approved local, regional, or state conservation plan that specifically address aquatic species using the affected environment.

## ISSUES NOT DISCUSSED FURTHER

Construction-related impacts on water quality and resulting effects on beneficial uses, including aquatic life uses, are described in detail in Section 3.9, “Hydrology and Water Quality,” and thus are not repeated here. The reader is referred to Section 3.9, Impact 3.9-1 for the assessment of construction-related effects of the proposed project on water quality and resulting effects on aquatic biological resources.

# IMPACT ANALYSIS

## Construction-Related Impact Assessments

### Impact 3.4-1: Result in Construction-Related Underwater Noise and Vibration Impacts on Fish and Their Prey Organisms

Construction-related underwater noise, vibrations, and disturbance from constructing the CTF outfall has the potential to affect migrations and movements of fish near the outfall site or cause adverse effects on prey resources in the area. Most fish would move past the construction site in a portion of the river channel that is a sufficient distance from the area of disturbance and thus would not experience noise or vibrations at levels that would cause any chronic, adverse effects on fish. Fish that move close enough to the pile driving to experience a startle response from the underwater noise levels would simply move away from the noise, or drift with the currents past the site and away from the disturbance. In addition, all work would be limited to daylight hours during the week, leaving extensive periods of undisrupted passage for migrating fish and resident fish to move past the site daily in the evenings, in between periods of pile driving, and on weekends when no construction would occur. Any small, localized losses of BMI and zooplankton from noise generated by pile driving activities would be minimal and would not have population-levels effects. Therefore, underwater noise and vibrations from construction-related activities would not lead to substantial adverse effects on special-status fishes, resident fishes, or their prey resources and would not interfere substantially with the movement of any native resident or migratory fish species past the construction site. This impact would be **less than significant**.

Before any construction on the waterside of the levee occurs, a temporary coffer dam would be erected using fifty 5-foot-wide by approximately 60-foot-tall sheet piles. The piles would be put into place using a 200-ton crawler crane positioned on the levee crown. To facilitate the crane reaching the full extent of the area where sheet piles would be placed, the levee crown, above the ordinary high-water mark, would be temporarily widened using crane mats and jump bridges to facilitate crane operations. Once each sheet pile is put in position using the crane, a vibratory driver fitted on the crane would be used to vibrate each sheet pile into place, up to approximately 40 feet below the riverbed. The footprint of the coffer dam is estimated to be approximately 0.003 acre and 250 linear feet in length and would enclose an area of approximately 0.18 acre. It is estimated that approximately 10 sheet piles can be placed per day, for a total of approximately 5 days to complete construction of the temporary coffer dam. The coffer dam is expected to be in place for approximately 6 weeks.

Operating construction equipment on the waterside of the levee, and pile driving sheet piles into the San Joaquin River, would result in temporary periods of elevated underwater noise and vibration levels. Using a vibratory hammer to vibrate the sheet piles into the sediment is the proposed project component that would generate the most underwater noise. Pile driving would result in temporary periods of elevated noise levels within the San Joaquin River over a period of approximately 5 days, followed by substantially lesser underwater noise levels during the period that the outfall is constructed, and when the sheet piles are removed at the end of the construction period.

<u>Effects on Fish</u>

Based on the general construction window typically imposed by the fish agencies for construction projects within rivers with ESA-listed fishes, the levee crossing and outfall construction are proposed to occur between July 1 and October 31. Therefore, the only special-status species and life stages that would be present in the river near the outfall during this period would be:

- adult and juvenile green sturgeon,
- adult and juvenile white sturgeon,
- adult and juvenile hardhead,
- adult steelhead,
- adult fall-run Chinook salmon,

- juvenile Pacific lamprey, and
- juvenile Sacramento splittail.

All other special-status species and life stages identified in Figure 3.4-1 would not be present in the river near the outfall during this construction window. Thus, there would be no impact on these special-status fish species/life stages that are not present during the construction phase of the project. The remainder of this analysis focuses on the fish species and life stages listed above that would potentially be present in the San Joaquin River in the vicinity of the outfall from July 1 to October 31.

Anthropogenic noise, such as pile driving, can trigger a reflexive startle and alarm responses in fish (Popper et al. 2019) causing fish to flee an area (Boussard 1981 as cited in Scholik and Yan 2002). Thus, increased noise can temporarily disrupt essential behavior patterns such as feeding and predator escapement. However, such transient startle responses are unlikely to result in adverse impacts because fish quickly return to normal behaviors (Popper et al. 2019). Abiotic and biotic sounds are important to fish and many use acoustic signals to communicate. Noise emanating from construction activities can temporarily reduce auditory sensitivity of some fish species and interfere with signals that affect communication, behavior and fitness (Popper and Hastings 2009; Purser and Radford 2011).

The type and severity of noise impacts would depend on several factors, including the intensity and characteristic of the sound, the distance of the fish from the source, the size of the fish, and the frequency and duration of the noise-generating activities. The Fisheries Hydroacoustic Working Group, which included representatives from the California Department of Transportation, Federal Highway Administration, Washington State Department of Transportation, Oregon Department of Transportation, Regions 1 and 8 of USFWS, and NMFS, developed an Agreement in Principal for Interim Criteria for Injury to Fish from Impact Pile Driving Activities. Although these interim criteria were designed to address sound exposure thresholds associated with pile driving activities, the criteria can also be applied to any anthropogenic, intense, and relatively long-duration sound such as that generated from heavy construction equipment (U.S. Department of the Interior and Bureau of Ocean Energy Management 2012). The interim criteria used to determine the onset of physiological effects on fishes are presented in Table 3.4-3.

**Table 3.4-3 Fisheries Hydroacoustic Working Group Underwater Noise Criteria for Injury to Fish from Pile-Driving Activities**

| Effect | Metric | Fish Mass | Threshold |
|---|---|---|---|
| Onset of physical injury | Peak pressure | N/A | 206 dB (re: 1 μPa) |
| | Accumulated sound exposure level | ≥ 2 grams | 187 dB (re: 1 μPa) |
| | | < 2 grams | 183 dB (re: 1 μPa) |
| Adverse behavioral effects | Root mean square pressure | N/A | 150 dB (re: 1 μPa) |

Notes: dB = decibels, μPa = micropascal, N/A = not applicable.

Source: Fisheries Hydroacoustic Working Group 2008

While the criteria in Table 3.4-3 are the accepted noise criteria for assessing noise impacts on fish, the information used to determine the criteria was based on very limited experimental data and incomplete studies of the effects of pile driving (U.S. Department of the Interior and Bureau of Ocean Energy Management 2012). More recent research shows that onset of physiological response to noise by fish species, including salmonids, does not occur until noise levels are substantially higher than the criteria in Table 3.4-3 (U.S. Department of the Interior and Bureau of Ocean Energy Management 2012).

Popper et al. (2019) suggest the sound pressures to which fish actually respond are closer to 163 decibels (dB) (re: 1 micropascal [μPa]). However, further studies on wild fishes in their natural environment are necessary before a definitive behavioral threshold can be developed (Popper et al. 2019).

Most special-status species, including salmonids and sturgeon, are primarily detectors of particle motion, not sound pressure (Lovell et al. 2005; Meyer et al. 2012; Popper et al. 2019). Sturgeon, like other fish with swim bladders far removed from the ear, are unlikely to hear anthropogenic sounds unless they are very close to the sound source. It is unknown what level of particle motion would lead to behavioral effects of these species, but it is assumed that it would take a very high level of signal to prompt behavioral changes (Popper et al. 2019). It is likely that noise affects lamprey and Sacramento splittail similarly to salmonids because both species have nothing within the structure of the ear or associated structures to suggest any specializations that make them more than a hearing generalist (Popper 2005; Caltrans 2015). It is unknown how hardhead perceive sound (Caltrans 2015).

Pile driving introduces high intensity impulsive sound waves into the water column resulting in a rise in sound pressure. Sound pressure levels generated by pile driving are variable depending on the substrate being penetrated, distance from the source, and depth of the water (Popper et al. 2019). Underwater noise levels measured during installation of a coffer dam in Fort Bragg, CA resulted in peak sound pressures in the water of 170–174 dB approximately 33 feet (10 meters) from the site of pile driving (Caltrans 2015). This is well below the onset of physical injury for small (i.e., <2 grams) and large (i.e., ≥ 2 grams) fish described in Table 3.4-3, and similar to the 163 dB (re: 1 μPa) that Popper et al. (2019) suggest is the level at which fish initially respond to sound. The total time (i.e., 5 days to drive all piles) that vibratory pile driving would occur within the river would be relatively short. Each pile would take less than 1 hour to install, then there would be a period of time in between installation of each of the piles when little to no underwater noise would be generated.

Although the peak pressure for driving sheet piles exceeds the threshold at which Popper et al. (2019) suggest fish initially respond to sound, sound pressures associated with pile driving are not expected to exceed thresholds specified in Table 3.4-3 and thus would not be expected to cause injury or lasting, adverse behavioral effects on any fish species or life stage (Popper et al. 2019; Fisheries Hydroacoustic Working Group 2008).

Of the special-status fish species that may be present during in-water construction, Sacramento splittail is the only species that has the potential to spawn in the vicinity of the outfall location. However, Sacramento splittail spawning most frequently occurs on floodplains or edge habitats in March and April. Juveniles then move into the estuary between April and August (Moyle 2002). Therefore, all of the juvenile special-status fish that would be present during in-water construction activities would be larger juveniles and less susceptible to noise and vibration related effects because the fish would be able to move away from the sound if desired.

Regardless of how noise is measured, studies have shown that fishes exposed to pile driving sounds may show startle and alarm responses. If a fish did come close enough to the sound, the startle response from pile driving sheet piles with a vibratory hammer would be expected to be brief and unlikely to result in chronic, adverse behavioral effects on fish (Popper et al. 2019). Fish would be more likely to move away from the sound and use the large areas of the river that are not affected by the temporary noise generated by pile driving. Therefore, noise levels would not result in injury, death, or substantial delays of juvenile or adult special-status species migration or movements.

The remaining fish species occurring in the lower San Joaquin River include native and introduced fish that reside in the river year-round or seasonally (Table 3.4-1). These fish species occur in the lower San Joaquin River during the July 1-October 31 construction period and, thus, would be subject to the same potential construction-related noise and vibration effects discussed above for special-status species. Although some of these fish could be smaller than the juvenile special-status fish that may be present, disturbance and noise associated with construction-related activities is not expected to adversely affect the migrations or movements of these fish. The project would not significantly impact fish migration or movement because like special-status fishes, most fish would move past or avoid the construction area unimpeded in a portion of the channel that is a sufficient distance from the active construction area.

As described above, even the loudest construction-related noise and vibrations (i.e., pile driving) would not create noise or disturbance at levels that would create the onset of physical injury for small fishes (i.e., <2 grams). If any fish did come close enough to the construction area the startle response from pile driving sheet piles with a vibratory hammer would be expected to be brief and unlikely to result in chronic, adverse behavioral effects on fish (Popper et al. 2019). Because construction would be limited to daylight hours during the week, any potential for delays in movement past the construction area would be short-term (i.e., hours). Therefore, noise levels associated with construction of the proposed project would not result in blockage or delay of movement past the site or injury, death, or chronic, adverse behavior effects for juvenile or adult native or introduced fish species.

<u>Effects on Phytoplankton, Zooplankton, and Benthic Macroinvertebrates</u>

There is substantially less information available on the ability of aquatic invertebrates to detect sounds relative to fish (Popper and Hawkins 2018). Unlike fish, there are no guidelines available to protect invertebrates from anthropogenic generated underwater noise and vibrations.

Aquatic invertebrates have a variety of body parts that are likely responsive to particle motion including; hairs, chordotonal organs associated with joints (i.e., such as those in crayfish), and statocysts (i.e., balancing organs that are present in invertebrates such as mollusks) which resemble the sensory hair cells in vertebrate ears (Popper and Hawkins 2018 and references cited within). Evidence suggests anthropogenic sounds within the water column and emanating from substrate can repress burying behaviors, reduce surface relocation activity, and affect recruitment of BMIs (Solan et al. 2016; Hawkins and Popper 2017; Popper and Hawkins 2018). A variety of parameters, including if sounds are continuous, the types of substrate present, and species of macroinvertebrate, influence the potential for noise to affect invertebrates.

There is also very little information available regarding impacts of anthropogenic noise on plankton populations. A recent study found sound exposure levels from an underwater air gun caused significant mortality to marine zooplankton populations (McCauley et al. 2017). Although air guns are substantially louder than pile driving activities (220–250 dB at the source), the McCauley et al. 2017 study found noise from air guns could kill zooplankton up to 0.75 mile (1.2 kilometer) away from the source where sound measured 153 dB re 1 microPascal $(\mu Pa)^2$ s $(second)^{-1}$.

Short-term sounds that rapidly diminish are unlikely to translate into long-term consequences to invertebrates (Hawkins and Popper 2017). Therefore, the temporary noise generated by in-water construction activities, including driving sheet piles into the sediment for coffer dam construction would not have substantial adverse effects on zooplankton or the BMI population in the vicinity of the outfall. Although it is possible for some zooplankton to be affected by the pile driving noise (i.e., those located close to the piles being driven), the potential loss of these individuals would be negligible relative to the total plankton population and biomass that occurs in the lower San Joaquin River. Furthermore, plankton recolonize flowing waters rapidly. In summary, any short-term, localized losses in BMI and plankton production from pile driving activities would have negligible effects on the BMI and plankton populations and communities in the affected environment.

Disturbance and noise associated with construction-related activities would not adversely affect the migrations or movements of lower San Joaquin fishes, including ESA-listed fishes or fishes with other special-status designations because most fish would move past the construction area unimpeded in a portion of the channel that is a sufficient distance from the active construction area. Because all construction work would be limited to daylight hours during the week, any potential delays in fish movement past the construction area would be short-term (i.e., hours). Nevertheless, no delays are expected as fish would simply alter their migration route past the construction site rather than remaining there. Therefore, construction-related activities associated with the proposed project would not interfere substantially with the movement of any native resident or migratory fish species, including special-status species, or with established migratory corridors or nursery sites in the lower San Joaquin River. Although BMI and plankton populations cannot choose to move to an unimpeded area of the channel, temporary construction generated noise would have no long-term consequences to San Joaquin BMI or plankton populations or communities. Underwater noise that would occur would be temporary and would not be constant throughout the 24-hour day. Therefore, it would not reduce the amount of usable aquatic habitat within the affected environment or result in any permanent adverse changes to designated critical habitat for federal ESA-listed species. Finally, temporary disturbance and noise associated with construction-related activities would not have a substantial adverse effect on any riparian habitat or other sensitive natural community or conflict with the provisions of an adopted habitat conservation plan or other approved local, regional, or state conservation plan. Consequently, this impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.4-2: Cause Direct Fish Injury or Mortality during Construction Resulting in Impacts on Fish Populations

Construction of the coffer dam, subsequent dewatering of the area to provide a dry work area, and restoration of natural contours of the river post-construction have the potential to cause direct mortality or injury to special-status fishes or other fish of the lower San Joaquin River. The potential for direct mortality or injury to special-status fishes would be minimized by limiting in-river construction activities to the July 1 to October 31 period and installing a coffer dam to hydraulically isolate the outfall installation from the river. The very limited injury or mortality that could potentially occur to non-special-status fish species would not occur at a level that would cause a substantial reduction in their population. Nevertheless, it is possible that individual special-status fish could become stranded in the coffer dam footprint. The potential for direct mortality or injury to special-status fishes stranded within the coffer dam would constitute a substantial adverse effect to the special-status species and thus would be a **potentially significant** impact.

Before any construction on the waterside of the levee, a temporary coffer dam would be erected using fifty 5-foot-wide by approximately 60-foot-tall sheet piles. The piles would be put into place using a 200 ton crawler crane positioned on the levee crown. All outfall construction would take place within the coffer dam footprint and thus be isolated from the San Joaquin River. Following removal of the coffer dam after the outfall has been constructed, an excavator operating from the levee crown would restore the natural contours of the river to pre-project conditions, if needed. Thus, construction activities that could result in direct fish injury or mortality are installation and removal of the coffer dam, subsequent dewatering of the construction area within the coffer dam, and restoration of the natural contours of the river.

Based on the general construction window typically imposed by the fish agencies for construction projects within rivers with ESA-listed fishes, the levee crossing and outfall construction is proposed to occur between July 1 and October 31. Therefore, the only special-status species and life stages that would be present in the river near the outfall during this period would be:

- adult and juvenile green sturgeon,
- adult and juvenile white sturgeon,
- adult and juvenile hardhead,
- adult steelhead,
- adult fall-run Chinook salmon,
- juvenile Pacific lamprey, and
- juvenile Sacramento splittail.

All other special-status species and life stages identified in Figure 3.4-1 would not be present in the river near the outfall during this construction window. Thus, there would be no impact on those special-status fish species/life stages that are not present in the affected reach of the river during the construction phase of the project. Therefore, the remainder of this analysis focuses on the fish species and life stages listed above that would potentially be present in the San Joaquin River in the vicinity of the outfall from July 1 to October 31.

For coffer dam installation, sheet piles would be placed sequentially from upstream to downstream. Interlock sealant, such as sawdust, would be applied to sheet pile joints to keep them watertight. Upon completion of the coffer dam, submersible pumps fitted with screens to protect from entraining fishes would be placed inside the coffer dam to dewater the area to provide a dry work area. Water remaining inside the coffer dam would be pumped back over the levee into temporary ponds or Baker tanks on the landside of the levee for settling. Then the supernatant would be discharged to the river or pumped into the City storm drain system in accordance with the Clean Water Act Section 401 Water Quality Certification, U.S. Army Corps of Engineers Section 404 permit, and other applicable permit requirements.

The potential for San Joaquin River fishes, including ESA-listed fishes or fishes with other special-status designations, to be directly killed or injured by construction activities would be minimized or avoided by limiting in-river construction activities to the July 1 to October 31 period and installing a coffer dam to hydraulically isolate the outfall installation from the river. Underwater noise, turbidity, and flow pattern disruption (i.e., disruption of laminar flow vectors immediately adjacent to the equipment itself), would cause fish that would be present in the work area to likely avoid the equipment, thereby enabling most fish to avoid direct injury or mortality due to encountering sheet piles, excavator bucket, or other equipment within the river. Nevertheless, dewatering the coffer dam could potentially result in some fish being stranded within the coffer dam footprint which could result in direct mortality or injury of individual special-status fishes or other San Joaquin River fishes. Any losses or injury of non-special-status fish species would not result in any adverse population level effects because their populations are large and robust with adequate annual reproduction and recruitment. Conversely, mortality or injury of individual special-status fishes could potentially have population-levels effects. Therefore, the impact of construction-related direct mortality or injury to individual special-status fish that use the lower San Joaquin would be **potentially significant**.

## Mitigation Measures

### Mitigation Measure 3.4-2: Conduct Fish Rescue and Relocation Operation

The City will implement the following measures to avoid, minimize, and mitigate this potentially significant impact on San Joaquin River special-status fishes:

- A fish rescue operation will be completed as water elevations within the coffer dam reach low levels. Fish rescue will be completed by qualified biologists using dip and seine nets to remove any fish remaining within the coffer dam. All fish rescued from inside the coffer dam will be placed in the San Joaquin River away from construction activities.
- Once the dewatered area has been deemed free of any entrained fishes, the area will be completely dewatered using the submersible pumps. Depending on the amount of leakage between the sheet piles, the submersible pumps may have to be operated at regular intervals to keep the work area dry.

<u>Significance after Mitigation</u>

Implementing Mitigation Measure 3.4-2 would reduce the potentially significant impact on fish to a **less-than-significant** level. This is because construction would occur during the NMFS-approved July 1 through October 31 window when no ESA-listed salmonid juveniles, or delta smelt, are expected to be in the project reach of river and thus juvenile salmonids and delta smelt would not be expected to get entrained within the coffer dammed area. The only ESA-listed species that would be expected to be present as a juvenile life stage, and thus prone to potential entrainment, would be juvenile green sturgeon. There is a very low probability that a juvenile green sturgeon would be entrained in the enclosed coffer dammed area due to the noise and disturbance of coffer damming which is expected to move fish away from the area. Nevertheless, if one or more individuals would be entrained, juvenile green sturgeon are hardy and would handle being rescue seined and placed back in the river. This mitigation measure would ensure that most, if not all, fishes that become entrained within the coffer dammed area are safely removed and safely returned to the San Joaquin River prior to the start of construction work within the coffer dammed area. Any adverse effect to special-status fish species would be reduced by this mitigation measure to a less-than-substantial level. Any losses of small numbers of individual non-special-status fishes would have no population-level effects on the species.

### Impact 3.4-3: Result in Adverse Effects on Aquatic Species Because of Alterations in Aquatic and Riparian Habitat during Construction

Implementation of the proposed project, including construction of the proposed outfall and installation of the new effluent discharge pipe over the San Joaquin River levee, would result in disturbance to or direct removal of a small amount of riparian vegetation and temporary modifications to a small area of aquatic habitat. Such modification of this area of the lower San Joaquin River would not have an appreciable effect on the overall quantity and quality of available habitat for fish, BMI, or plankton communities within the river. Consequently, adverse effects on aquatic species due to alterations in aquatic and riparian habitats of the lower San Joaquin River during construction would be **less than significant**.

Construction-related activities associated with the proposed project would result in temporary dewatering of a small area of the river behind the coffer dam (approximately 0.18 acre) and localized modification of riparian habitats (approximately 0.16 acre of riparian forest). When riparian vegetation is present along a river, it can provide shaded riverine habitat features including the ability to promote localized water cooling and increased BMI production.

Dewatering the 0.18 acre within the coffer dammed work area for outfall construction would result in a localized and temporary loss of BMIs in the dewatered area. However, given the small area that would be dewatered and disturbed by this construction, relative to the total acreage of aquatic habitat available for BMI production in the lower San Joaquin River, the percentage of the lower San Joaquin River BMI community lost would be negligible, relative to the entire BMI community that exists in the lower San Joaquin River. Such losses would not be sufficiently large to adversely affect the prey base for fishes using the river. Given the rapid recolonization rate of BMIs, the small disturbed area within the channel would be completely recolonized by BMIs within a year of rewatering the dewatered area following construction.

The riparian habitat along the San Joaquin River is composed of valley oak woodland and forest (*Quercus lobata* forest and woodland alliance). No trees would be removed for the proposed project, but shrubs, including buttonbush and willow would be removed. Potential effects of altering riparian vegetation are highly variable, ranging from increased sedimentation and warmer localized stream temperatures to decreased food production and habitat complexity (Werner et al. 2005, Baxter et al. 2005) ). The permanent removal of riparian vegetation at the outfall site would not affect water temperature within the San Joaquin River as no vegetation (i.e., trees) that provides any substantial shade would be removed. Removal of a very small amount of riparian bushes and grasses would not affect habitat quality or complexity within the lower San Joaquin River. Fish food production within the San Joaquin River also would not be affected from the very small and localized removal of riparian bushes and grasses.

Based on the above considerations, construction-related activities are expected to cause short-term and localized alterations of aquatic benthic, and riparian habitats where the new outfall would be constructed. However, due to the very small area of habitat that would be affected, the short-term nature of the dewatering, and rapid recolonization ability of BMI populations, the construction of the proposed project would not 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 NMFS, USFWS, or CDFW. The magnitude and geographic extent of effect to riparian and aquatic habitat would not result in a substantial adverse effect on the river's riparian community or other sensitive aquatic habitats or natural communities identified in local or regional plans, policies, regulations or by CDFW, USFWS, or NMFS. Hence, these effects would not result in physical, chemical, or biological conditions that would cause substantial reductions in non-special-status fish populations or abundance of phytoplankton, zooplankton or BMIs. Consequently, these small, localized and temporary effects on benthic and riparian habitats would not result in any permanent adverse changes to designated critical habitat for green surgeon, steelhead, or delta smelt. Therefore, impacts on aquatic species due to alterations in aquatic and riparian habitats within the lower San Joaquin River during construction would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Operations-Related Impact Assessments

All permanent effects on San Joaquin River water quality, with the exception of temperature, and their effects on beneficial uses, including impacts on aquatic life beneficial uses, are assessed in Section 3.9, "Hydrology and Water Quality," and thus are not repeated here. Therefore, the proposed project's operations-related impacts on aquatic biological resources provided below focuses on direct and indirect temperature-related impacts, impacts due to altered river flows with CTF discharges, and direct and indirect impacts from modified in-river physical habitat conditions.

### Impact 3.4-4: Result in CTF Discharge-Related Effects on Seasonal Fully Mixed River Temperatures and Associated Thermal Impacts on Fish, Phytoplankton, Zooplankton, and BMI

CTF discharges at 2.5 and 6.0 mgd ADWF would result in minor increases (i.e., ≤0.6°F and typically ≤0.3°F) in fully mixed San Joaquin River temperatures. The minor river temperature increases that would occur would not be of sufficient magnitude to block or delay fish migrations/movements past the outfall area; cause lethality or chronic, adverse sublethal effects on any species of fish, phytoplankton, zooplankton, or BMI using the river in the vicinity of the proposed outfall; reduce the amount of usable aquatic habitat within the affected environment; or result in adverse changes to designated critical habitat for federal ESA-listed species. Because fully mixed river temperatures with the project would not cause adverse effects on fish, phytoplankton, zooplankton, or BMI at the individual level, no population-level or community level adverse effects would occur. This impact would be **less than significant**.

This assessment addresses the temperature effects that CTF discharge at rates of 2.5 mgd and 6.0 mgd ADWF would have on the San Joaquin River, and how these river temperature increases would, in turn, affect aquatic biological resources of the San Joaquin River. It does so by assessing direct and indirect effects of CTF thermal discharges on the species assessed and their habitat, including designated critical habitat for ESA-listed species. The degree to which aquatic biological resources may be adversely affected by CTF discharge-related temperature increases is a function of:

- existing San Joaquin River temperature conditions,
- species and life-stage specific timing of being within the project area,
- species and life-stage specific thermal tolerances,
- type and degree of species' use of the affected environment, and
- the project's direct and indirect effects on river temperature and habitat conditions within the affected environment.

Many fish species use the project area of the San Joaquin River over the course of a year (Table 3.4-1). However, the federal ESA-listed species of green sturgeon, steelhead, spring-run and winter-run Chinook salmon, and delta smelt represent species that are (1) physiologically the most thermally sensitive of all fish species using the affected environment (Table 3.4-2), and (2) most prone to thermal impacts due both to their species- and life-stage-specific thermal sensitivities and their threatened/endangered population status. Consequently, detailed assessments are performed for these four thermally sensitive, ESA-listed species. Although not listed under the federal ESA, fall-run Chinook salmon also are thermally sensitive and use the river and thus were included in the assessment.

If no significant adverse thermal effects are determined for any of the life stages of these most thermally sensitive fish species, then it could also be concluded that CTF discharges at rates of 2.5 mgd and 6.0 mgd ADWF would cause no significant adverse thermal effects on all other more thermally tolerant fish species using the San Joaquin River. Separate thermal assessments are made for these fishes' prey organisms, including phytoplankton, zooplankton, and BMIs.

Seasonal discharges from the CTF associated with a 2.5 mgd ADWF discharge rate would cause small (i.e., ≤0.2°F) long-term average river temperature increases (for the entire January 1, 2008, through December 31, 2016, simulation period) at the outfall location in September through February. These discharges would cause no long-term average temperature increases for the months March through August, relative to the existing (i.e., no discharge) condition

(Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Table 5). The minor incremental increases that would occur at the outfall location would further attenuate to river background temperatures with increasing distance downstream of the outfall. Simulated fully mixed river temperature output for the nearest DSM2 node upstream of the outfall location (i.e., 1.9 miles upstream of the outfall) showed no incremental increase in fully mixed river temperatures (Appendix E, Table 7). Although the river at the outfall location is tidally influenced, full reverse flows do not occur in all years and have shorter upstream excursions when they do occur compared to river locations farther downstream where tidal influences are greater. Due to this phenomenon, simulated fully mixed river temperature output for the DSM2 node located 1.9 miles upstream of the outfall showed no long-term average incremental increases in fully mixed river temperatures.

The 2.5 mgd ADWF condition would not increase the maximum river temperature that would occur in any month by more than 0.1°F, relative to the existing (no discharge) condition. Exceedance plots of fully mixed river temperatures near the outfall for the 2.5 mgd ADWF scenario compared to the no discharge scenario show that the probability with which any given temperature would be exceeded would not differ for the 2.5 mgd condition, relative to the no discharge condition, for any month of the year (Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Figures A-1 through A-12, Appendix A). When fully mixed river temperatures near the outfall were modeled for 2.5 mgd ADWF and No discharge conditions, and compared on a daily average basis, maximum daily average river temperature increases for the 2.5 mgd ADWF discharge condition were ≤0.3°F (i.e., immeasurable) for all months of the year (Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Figures B-1 through B-12, Appendix B). Based on the DSM2 modeling of temperature, no measurable build-up of temperature occurs over time in the project reach of the river during any month modeled. These fully mixed temperature findings are largely because at 2.5 mgd ADWF, the CTF discharge averages 0.2 to 0.8 percent of river flow, which corresponds to an average dilution ratio of 455:1 to 125:1, depending upon the month.

A 6.0 mgd ADWF discharge rate also would cause small (i.e., ≤0.5°F) long-term average river temperature increases (for the entire simulation period) at the outfall location November through February, and ≤0.2°F (i.e., immeasurable) long-term average increases March through October, relative to the existing (no discharge) condition (Table 8 in Appendix E, "Aquatic Biological Resources Thermal Effects Assessment,"). Exceedance plots of fully mixed river temperatures near the outfall for the 6.0 mgd ADWF discharge condition show that the probability with which any given temperature would be exceeded would not differ discernably, relative to the no discharge condition, for any month of the year (Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Figures A-1 through A-12, Appendix A). When fully mixed river temperatures near the outfall were modeled for the 6.0 mgd ADWF discharge condition and the no discharge condition and compared on a daily average basis, maximum daily average river temperature increases under the 6.0 mgd ADWF discharge condition were ≤0.6°F for the months September through March, and ≤0.3°F (i.e., immeasurable) for the months April through August (Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Figures B-13 through B-24, Appendix B). No measurable build-up of temperature occurs over time in the action area during any month modeled. At 6.0 mgd ADWF, the CTF discharge averages 0.5-1.9 percent of river flow, which corresponds to an average dilution ratio of 200:1-50:1, depending upon the month.

The small project-related temperature increases that would occur in the San Joaquin River in the vicinity of the proposed CTF outfall and for some distance downstream would result in river temperatures that remain suitable for fish, phytoplankton, zooplankton, and BMI. Project-condition river temperatures (at both 2.5 mgd and 6.0 mgd ADWF discharge rates) would not increase to levels that would block or delay any special-status adult fish immigration or juvenile/larval fish emigration past the outfall. Moreover, project-condition fully mixed river temperatures would not result in thermally induced lethality or any chronic, adverse sublethal effects in adults (e.g., reduced fecundity) or juvenile/larval life stages (e.g., reduced growth rates) for the thermally sensitive special-status fishes assessed (Appendix E, Section 3.2). Consequently, project temperature effects would not block or delay movements, result in thermally induced lethality, or any chronic adverse sublethal effects on any other fish species using the river that are more thermally tolerant than the special-status species assessed. Finally, project-condition river temperatures would not cause lethality or any chronic, adverse sublethal effects (e.g., reduced reproduction or biomass) to phytoplankton, zooplankton, or BMI using the affected reach of the river. Therefore, the project's fully mixed temperature effects would not reduce the quantity or value of critical habitat designated for green sturgeon, steelhead, or delta smelt, which includes the proposed CTF outfall reach of the San Joaquin River (Appendix E, Section 3.2.6). Because fully mixed river temperatures with the project would not cause adverse effects on fish, phytoplankton, zooplankton, or BMI at the individual level, no population-level or community levels adverse effects would occur.

Based on the analysis summarized above, and discussed in greater detail in Appendix E, Section 3.2, the effect of CTF river discharges at 2.5 mgd and 6.0 mgd ADWF on fully mixed San Joaquin River temperatures would not have any substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NMFS. The project's fully mixed river temperature effects would not interfere with the movement of any native resident or migratory fish species, reduce the amount of usable aquatic habitat within the affected environment, or result in adverse changes to designated critical habitat for federal ESA-listed species that would reduce the quantity or value of such habitat to the listed species. Finally, such fully mixed temperature effects would not conflict with the provisions of an adopted habitat conservation plan; natural community conservation plan; or other approved local, regional, or state conservation plan that specifically address aquatic species using the affected environment. Based on these determinations, this impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.4-5: Cause Thermal Impacts on Fish, Phytoplankton, Zooplankton, and BMI Moving Past or through the Thermal Plume near the CTF Outfall

CTF discharges at 2.5 and 6.0 mgd ADWF would result in a thermal plume within the San Joaquin River near the outfall. The thermal plume conditions that would occur throughout the year under various effluent and river temperatures and flow conditions would not block or delay special-status fish migrations past the outfall, cause lethality to adult, juvenile, or larval life stages of fishes passing through the plume, or cause any chronic, adverse sublethal effects. Because no adverse effects would occur to individual fish, no population-level adverse effects would occur. Similarly, the thermal plumes that would be present in the channel near the outfall would not cause lethality or any chronic, adverse sublethal effects on phytoplankton, zooplankton, or BMIs drifting through the plume. Because no adverse effects would occur at the individual level for these aquatic organisms, which have similar or greater thermal tolerances to that of fish, no population or community-level adverse effects would occur due to the thermal plumes. Finally, the thermal plumes would not cause increased predation on emigrating special-status fishes or reduce the quantity or value of usable habitat, including designated critical habitat for ESA-listed fishes. This impact would be **less than significant**.

This impact assessment addresses the effects that the thermal plume, created by the CTF discharges prior to effluent fully mixing across the river channel, could have on thermally sensitive, special-status adult fish immigration and juvenile (and larvae for delta smelt) emigration. In addition, plume thermal effects on phytoplankton, zooplankton, and BMIs that could drift with river currents through the plume are assessed. The latter effects on these fish prey organisms are also assessed in terms of their effects on the quantity and value of critical habitat that has been designated for federal ESA-listed green sturgeon, steelhead, and delta smelt, which includes the project reach of the San Joaquin River. Finally, the energetic consequences of fish altering their migration routes due to the plume are assessed, as is the potential for the thermal plume to attract and hold piscivores, thereby increasing predation on emigrating special-status fishes.

As stated above for the fully mixed river temperature analysis, if the CTF's thermal plume would not cause any significant adverse impacts on the most thermally sensitive special-status species assessed, then the thermal plume would not result in any significant adverse thermal impacts on other fish species that are less thermally sensitive when they move past/through the thermal plume. Also, impacts of the CTF thermal plume on phytoplankton, zooplankton, and BMI populations (i.e., fish prey organisms) are assessed below as part of assessing plume thermal effects on designated critical habitat for special-status fishes because of their sensitivity to such impacts. Because other fish species using the action area also rely upon these same prey organisms, findings regarding the CTF's thermal plume effects on phytoplankton, zooplankton, and BMIs apply to all fishes relying upon these prey organisms, and not just ESA-listed fishes.

Because the plume occupies a relatively small portion of river within the action area, and an even smaller portion of critical habitat occupied by any given adult and juvenile ESA-listed fish species over time, fish exposure to the plume is brief. Typically, exposures are anticipated to last seconds to minutes and thus constitute short-term acute exposures as they migrate through the plume rather than long-term, chronic thermal exposure scenarios as was considered and assessed for the fully mixed river condition in Impact 3.4-4. Therefore, this impact analyzes effects on adult and juvenile (as well as the larval life stage for delta smelt) fish migration through the plume itself.

Despite exposures being brief, fish lethality, loss of equilibrium, or short-term energetic and metabolic effects could theoretically occur if plume temperatures reach sufficiently high levels relative to the species' and life stage thermal tolerance limits as they relate to plume exposure durations. Should plume temperatures and exposure times not exceed effect thresholds, then fish that migrate through the plume would not be expected to experience any chronic adverse physiological or behavioral effects because the short exposure time to elevated plume temperatures would not be sufficiently long to result in such adverse chronic effects.

Adult special-status fishes immigrating upstream and downstream and larvae and juveniles emigrating downstream past the proposed CTF outfall may encounter the thermal plume at and near the outfall, where they may encounter a gradient of elevated water temperatures relative to river background temperature, across a portion of the channel cross-section occupied by the thermal plume. Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Section 3.3 evaluated CTF worst-case and median-case thermal plumes for each month of the year (which book-end the worst-case half of all possible CTF thermal plume scenarios). The analysis used this approach to determine whether the thermal plumes would cause blockage or delay of adult immigration, juvenile/larval emigration, or cause lethality or any chronic, adverse sublethal thermal effects on thermally sensitive, special-status fishes passing the plume. Should neither the worst-case nor median-case plumes cause adverse effects on migrating fishes, then the other "best-case" half of plume conditions also would have no adverse effects on these migrating fishes. This focus of the assessment on the "worst-case half" of all possible plume conditions allows for fewer scenarios to be analyzed, yet analysis conclusions cover all possible plume scenarios under all possible effluent and river flow and temperature combinations. The median-case and worst-case conditions were modeled for both the 2.5 mgd and 6.0 mgd ADWF scenarios for each month of the year, and all plume graphics produced are presented in Appendix E, Appendix C.

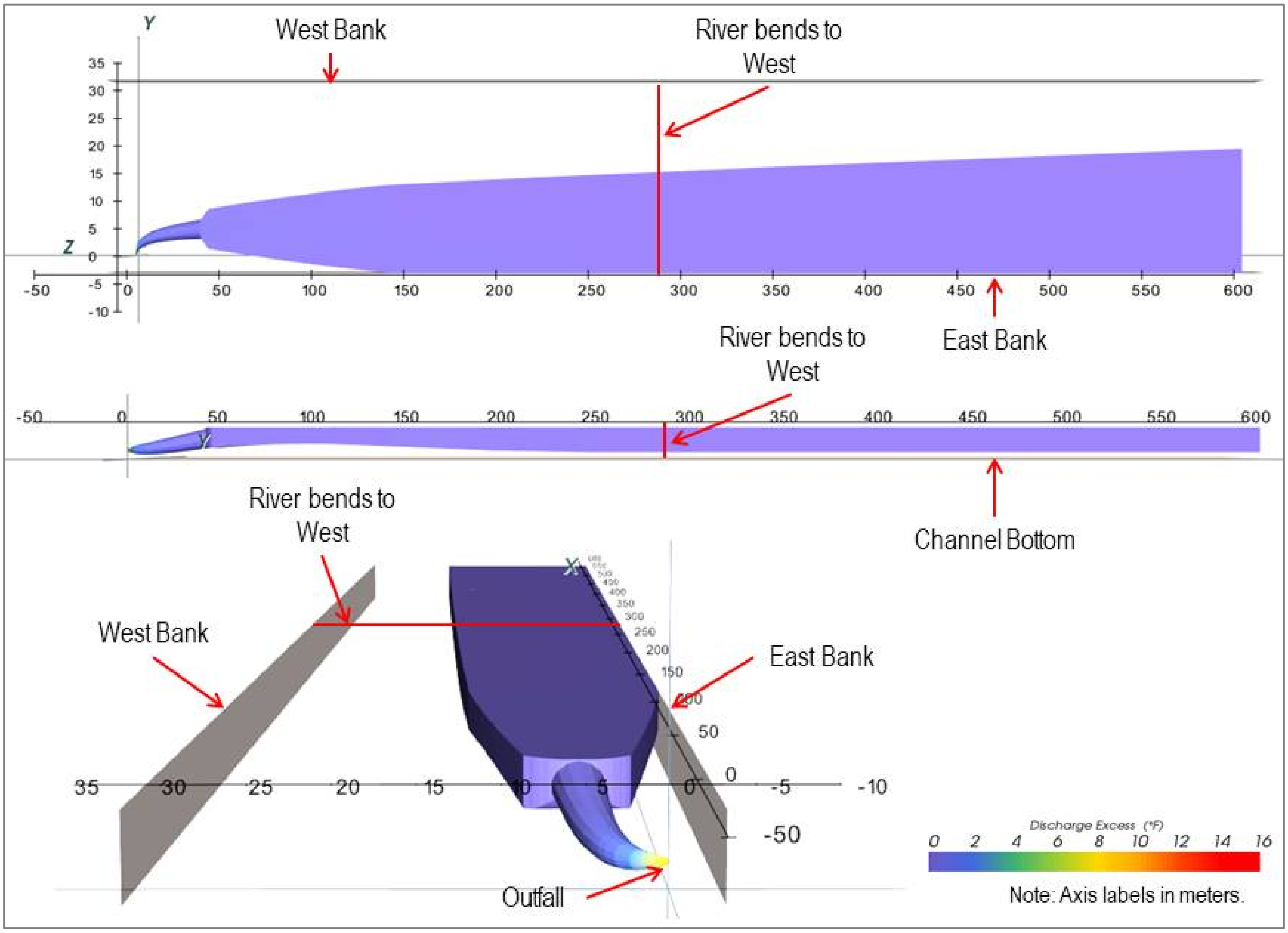
<u>Adult Immigration</u>

As adult fish approach the outfall from downstream areas (where effluent is fully mixed with the river flow), they eventually encounter a plume that does not cover the entire river cross-section. When fish initially encounter the downstream most portion of the plume, plume temperatures would be less than 1°F above river background temperatures. Fish would be expected to simply move through this region of the plume because the absolute temperatures would differ little from river background temperatures.

Nevertheless, when adult fish get close to the outfall (i.e., within tens of meters), temperatures within the plume would increase. Immigrating fish could seek lower temperatures by moving laterally or vertically within the river channel until they encounter either more preferred temperatures or an unaffected zone of passage that is outside the plume where they can continue their upstream migration. Numerous studies have shown that, when presented with a range of temperatures, fish will seek a temperature that is preferred, and will not submit themselves to temperatures sufficiently high to cause adverse physiological effects (Cherry et al. 1975; Gray et al. 1977; Biro 1998). In doing so, they could continue along a selected channel migration route that would expose them to temperatures less different, or even no different, from river background. In either case, should fish "drift" back toward the affected area of the plume before passing the outfall, the same behavioral response would be repeated until the migrating fish is past the outfall.

As an example of typical plumes that would occur in the vicinity of the CTF outfall, median-case and worst-case thermal plume graphics for the 6.0 mgd ADWF discharge condition in March are presented below and assessed in terms of their thermal effects on immigrating green sturgeon, steelhead, spring-run Chinook salmon, and delta smelt. Source: prepared by RBI in 2020

Figure 3.4-2 illustrates the ample zones of passage that fishes have to move past the outfall and shows the portion of the plume having the largest thermal gradient nearest the outfall pipe. The temperature differential for the March median scenario is 14.7°F. It should be noted that CORMIX does not model the bend in the San Joaquin River that exists approximately 919 feet (280 meters) downstream of the proposed CTF outfall location. Rather, it accounts for basic channel bathymetry (i.e., width and depths), depth and diameter of the outfall pipe within the channel, temperature differentials and effluent and river flows, but assumes a simple straight channel. Nevertheless, the graphical depictions of the plumes are adequate for assessment purposes.




Source: prepared by RBI in 2020

**Figure 3.4-2 March 6.0 mgd Median-Case Thermal Plume Scenario, Based on Effluent Temperature of 74.3°F, River Temperature of 59.6°F (14.7°F Temperature Differential), Effluent Flow of 6.70 mgd, and River Velocity of 1.49 Feet per Second**

The top graphic in Source: prepared by RBI in 2020

Figure 3.4-2 shows that a substantial zone of passage (i.e., area of the river unaffected by the plume) would exist along the western half of the river channel, within about 984 feet (300 meters) of the outfall (upstream of the large bend in the river), Hence, adult fish immigrating within the central and western portion of the channel would be unaffected by the plume.

The longitudinal cross-section portion of Source: prepared by RBI in 2020

Figure 3.4-2 (middle graphic) shows that the plume would reach the river surface about 164 feet (50 meters) downstream of the outfall. The plume would remain in the approximate top half of the water column for the initial 656 feet (200 meters) downstream. This would occur because the effluent plume is warmer than river temperatures and thus is buoyant. Once the plume temperature has attenuated to near background river temperature, it would mix vertically into the water column, reaching the river bottom at about 820 feet (250 meters) downstream of the outfall, as the river enters the large channel bend. Adult fish immigrating in the lower portion of the water column within about 656 feet (200 meters) of the outfall would pass underneath the plume as they pass the outfall structure.

All three panels in Source: prepared by RBI in 2020

Figure 3.4-2 show that the plume temperature would be rapidly attenuated within the initial 66 feet (20 meters) from the outfall pipe, to within about 1°F of river background. Adult fish immigrating through the plume at distances greater than about 66 feet (20 meters) from the outfall pipe would experience temperatures in the high 50s to low 60s, which would result in no blockage or adverse thermal effects because such temperatures are within about 1°F of river background temperatures to which these fish are acclimated, and temperatures in the high 50s°F to low 60s°F are suitable for immigrating green sturgeon, steelhead, spring-run Chinook salmon, and delta smelt, which can migrate through the area in March.

Where the most rapid initial temperature attenuation occurs, within about 33–49 feet (10–15 meters) of the outfall, the plume would occupy a very small portion of the water column, leaving the vast majority of the channel cross-section unaffected by the plume and thus easily avoided by immigrating adult fish. Most immigrating adult fish would never be exposed to plume temperatures that are substantially above river background temperatures nearest the outfall due to zones of passage that would exist within the channel below, above, and to the west of the outfall pipe.

Nevertheless, should immigrating green sturgeon, steelhead, spring-run Chinook salmon, or delta smelt swim through the plume within about 49 feet (15 meters) of the outfall pipe, where temperatures would be substantially higher than river background temperatures, fish would pass through the small footprint of the plume that would exist there in a matter of seconds because the plume would be ≤ 16 feet (≤ 5 meters) in diameter this close to the outfall (Source: prepared by RBI in 2020

Figure 3.4-2). River background temperature for this median scenario in March would be in the high 50s°F to low 60s°F. Adult fish that swim through the plume close to the outfall would encounter plume temperatures up to about 6–8°F above river background temperatures and thus in the mid to high 60s°F (see yellow color closest to outfall pipe in Source: prepared by RBI in 2020

Figure 3.4-2). Hence, even the warmest portion of the plume would remain in the mid to high 60s°F. Based on green sturgeon, steelhead, spring-run Chinook salmon, and delta smelt thermal tolerances (Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Tables 11, 13, 14, and 15), no blockage/delay of immigration would occur. Moreover, no thermally induced lethality or any chronic, adverse sublethal (e.g., reduced fecundity) thermal effects on immigrating adult fish acclimated to temperatures in the high 50s°F to low 60s°F would occur when these fish swim through a small plume of water in the mid to high 60s°F, and pass through this portion of the plume in a matter of seconds.

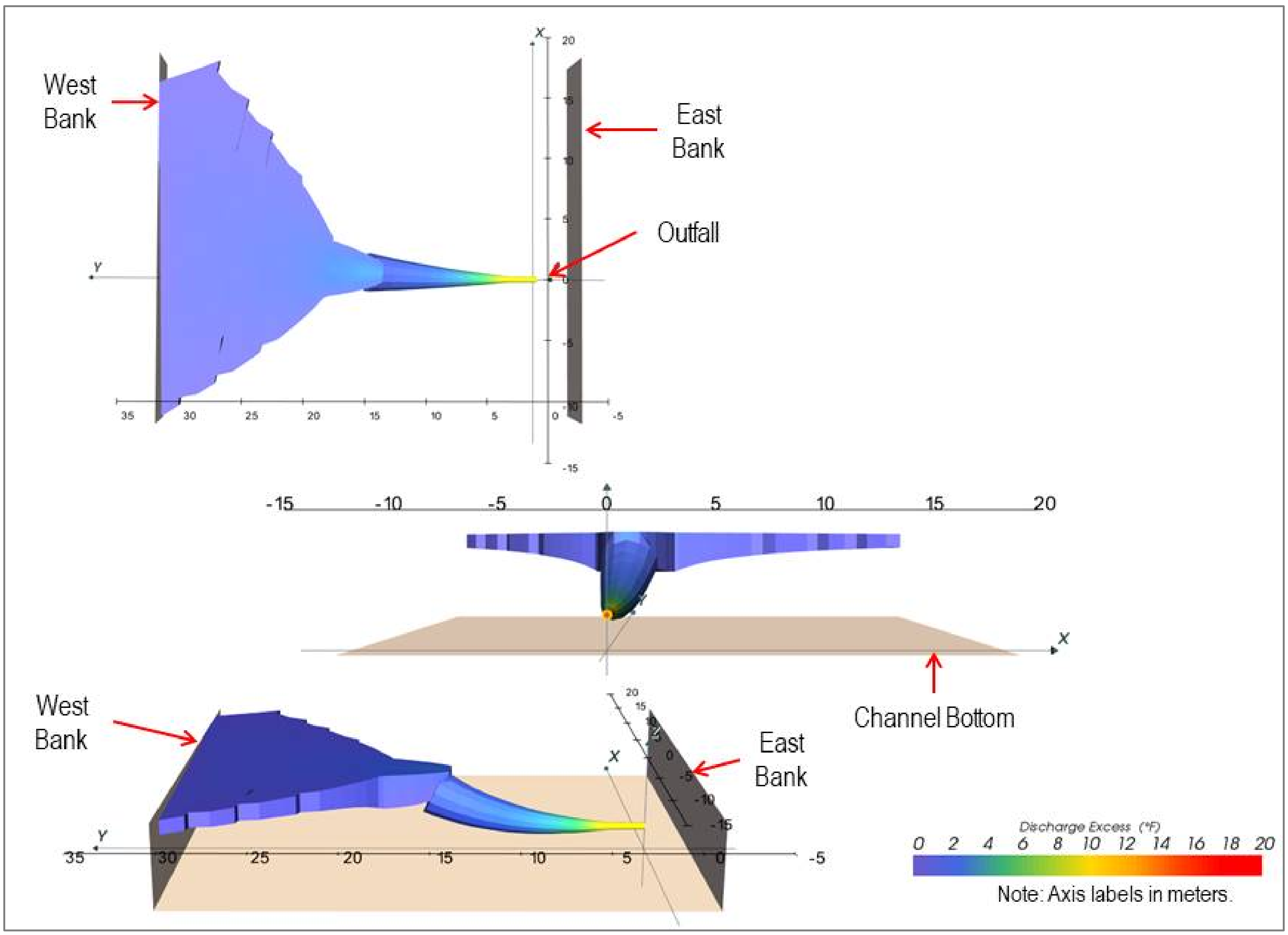
Figure 3.4-3 provides a depiction of the "worst-case" March thermal plume that would occur for the 6.0 mgd ADWF discharge scenario. The CORMIX model requires a positive flow rate for the model to run. Hence, to model slack-tide conditions, a river flow rate of 0.05 fps was selected for all worst-case plume modeling scenarios. Also evident in Source: prepared by RBI in 2020

Figure 3.4-3 is that CORMIX's graphical depiction of the plume stops at approximately 98 feet (30 meters) from the outfall. This is because when river directional velocity falls below a minimum threshold, the model is no longer able to simulate plume dispersion and mixing within the channel. Nevertheless, the warmest portion of the worst-case plumes are shown and thus used for assessment purposes.

Because the river velocity modeled is approaching zero, the velocity of the effluent leaving the pipe pushes the effluent plume straight across the channel toward the west bank. This occurs because there is insufficient river flow velocity in a downstream direction to "bend" the plume downstream, as is shown in the March median-case scenario, where river velocity was 1.49 fps (Source: prepared by RBI in 2020

Figure 3.4-2). Due to the high temperature differential of 18.1°F, the plume would be highly buoyant and would stay in the upper portion of the water column, leaving a large zone of passage underneath the plume as was discussed above for the median-case March scenario. In short, the majority of immigrating adult fish would move through zones of passage unaffected or minimally affected thermally by the plume. Only a small portion of fish moving past the outfall would pass through the warmest portion of the plume nearest the outfall pipe. Fish passing through the plume within 33–49 feet (10–15 meters) of the outfall pipe could experience temperatures up to about 10°F above river background for this worst-case scenario in March (Source: prepared by RBI in 2020

Figure 3.4-3). However, because of the small size of the plume where temperatures are most elevated, fish would only be exposed to such elevated temperatures for a matter of seconds. Such exposure would not block or delay green sturgeon, steelhead, spring-run Chinook salmon, or delta smelt migrations, nor would such exposures result in lethality or any chronic, adverse sublethal effects on immigrating adults of these species. Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Section 3.3.1 performs the same assessment as that presented above for March for green sturgeon, steelhead, spring-run and fall-run Chinook salmon, and delta smelt for 2.5 mgd and 6.0 mgd ADWF, for all other months of the year, and reaches the same conclusions stated above for the 6.0 mgd ADWF discharge scenarios in March. Because there would be no adverse thermal effects on these thermally sensitive special-status species assessed, it can be concluded that, likewise, there would be no adverse thermal effects on other more thermally tolerant adult fishes as they move past the outfall.




Source: prepared by RBI in 2020

Figure 3.4-3 March 6.0 mgd Worst-Case Thermal Plume Scenario, Based on Effluent Temperature of 72.6°F, River Temperature of 54.5°F (18.1°F Temperature Differential), Effluent Flow of 7.55 mgd, and River Velocity of 0.05 Feet per Second

## Juvenile/Larval Emigration

Like upstream immigrating adult fish, most juvenile fish emigrating downstream would pass the outfall via a zone of passage that is unaffected or minimally affected (i.e., ≤1–2°F above background temperatures) by the thermal discharge. Such zones of passage cover the majority of the water column, as shown in the monthly plume graphics in Appendix E, "Aquatic Biological Resources Thermal Effects Assessment," Appendix C. Only those fish that move past the outfall within about 33–49 feet (10–15 meters) of the outfall pipe would encounter the greatest thermal gradients that exist within the plume nearest the outfall. Fish migrating through the portion of the plume having the largest thermal gradient would be subjected to one of three possible thermal exposures. The first is when net flow is in a downstream (north) direction. In this case, fish coming from the south (upstream) would be subjected briefly to an abrupt and substantial increase in temperature upon encountering the warmest portion of the plume, followed by a gradient of rapidly decreasing temperatures as the thermal plume mixes with river water, thereby causing temperatures to become attenuated, rapidly returning to within 1°F of background temperatures within ≤ 98 feet (≤ 30 meters) of the outfall pipe in all months, with further temperature attenuation occurring with increasing distance downstream. This type of exposure, commonly referred to as thermal shock when the temperature increase is substantial, could have adverse effects on emigrating fish if the exposure temperatures are outside the range of the thermal tolerance for the species and life stage.

The second exposure scenario exists at slack tide. Under slack-tide conditions, most emigrating fish would pass the outfall via the ample zones of passage that are either unaffected or minimally affected thermally by the plume (see worst-case condition plumes in Appendix E, Appendix C). The portion of the plume within about 49 feet (15 meters) of the pipe, where the largest thermal gradients occur, would be oriented perpendicular to the river channel at slack tide (e.g., Source: prepared by RBI in 2020

Figure 3.4-3). Consequently, fish emigrating in a downstream direction would move through the warmest portion of the plume in just a few seconds because it would only be a few meters wide near the outfall, and thus once through several meters of water having elevated temperatures nearest the outfall, fish would then enter into unaffected waters on the downstream side of the plume. As these fish continue to move downstream, they could reencounter portions of the plume, but plume temperatures farther downstream would be ≤1°F above river background temperatures.

The third exposure scenario exists on a flood tide when the thermal plume moves upstream (south) of the outfall on a reverse-flow and emigrating fish are coming from the south. These fish would initially encounter the far reaches of the plume where temperatures are elevated only tenths of a degree above background. As fish move closer to the outfall, they likely would encounter zones of passage and avoid passing through the warmest portion of the plume nearest the outfall pipe along the eastern and central portions of the river channel. Those fish migrating near the eastern bank of the river at or just above the depth of the outfall pipe would experience increasing temperatures as they get closer to the outfall, followed by a rapid return to background temperatures once past the outfall.

Although the three thermal exposure scenarios identified above differ, they can be similarly assessed primarily because the length of time that fish would be exposed to plume temperatures is short, and the time exposed to plume temperatures multiple degrees above river background nearest the outfall would be very short – on the order of tens of seconds or less. Findings from Appendix E, Section 3.3.2 for the thermally sensitive special-status species assessed are that the CTF thermal plumes that would occur for 2.5 and 6.0 mgd ADWF discharges would not block or delay emigration, nor would the plumes cause lethality or any chronic, adverse thermal effects on any of the species assessed. Because there would be no adverse thermal effects on these thermally sensitive special-status species assessed, it can be concluded that, likewise, there would be no adverse thermal effects on other more thermally tolerant juvenile and larval fishes as they move past the outfall. Also, because no adverse effects on individuals would occur, no population-level adverse effects would occur for any of the fish species using the project reach of the river.

## Energetic Effects

Most fish immigrating past the proposed CTF outfall and associated thermal plume would not be expected to alter their migration route past the outfall due to the thermal plume. Nevertheless, should the thermal plume cause immigrating adult green sturgeon, steelhead, spring-run and fall-run Chinook salmon, or delta smelt to alter their migration route past the outfall to avoid large temperature differentials, such course change(s) within the channel would be small in nature (i.e., tens of meters or less). The extra energetic output immigrating adult or emigrating juvenile fish may expend to make such an alteration to their migration route within the channel near the outfall would be negligible and thus insignificant relative to the energetic expenditures these fish make for their overall migrations. Therefore, any minor alteration to fish migration routes would result in insignificant effects on the metabolic energy reserves of the fish that are used for adult upstream migrations to spawning areas and juvenile emigrations to downstream rearing sites. These insignificant additional energetic expenditures would not affect the survival of individual adult or juvenile fish migrating past the outfall, nor would such movements adversely affect immigrating adult or emigrating juvenile fish in sublethal ways (e.g., adult fecundity or juvenile growth or predation avoidance). Consequently, the insignificant effects on immigrating fish energetic expenditures would have no population-level effects on these fishes. Additional detailed assessment discussion is provided in Appendix E, Section 3.3.1.5 (adults) and 3.3.2.8 (juveniles). The same findings (i.e., lack of effects on individuals and no population-levels effects) are made for more thermally tolerant non-special-status resident and introduced fishes passing through the reach of river where the proposed outfall would be located.

Potential for Increased Predation on Emigrating Special-Status Fishes

The thermal plume that would be created at and for some distance downstream of the outfall would not be expected to attract and hold predatory fishes in the warmer water of the plume because the area of the plume that would be greater than 1-2°F above river background would be very small in area. In a study of the thermal impacts of Sacramento Regional County Sanitation District's Sacramento Regional Wastewater Treatment Plant (SRWTP) discharge on the aquatic life of the lower Sacramento River, Robertson-Bryan, Inc. (2013b) found no increased predation of hydroacoustic-tagged juvenile Chinook salmon smolts as they emigrated past the thermal plume associated with the SRWTP diffuser outfall in the Sacramento River near Freeport. This SRWTP has similarly high temperature differentials to that of the CTF, and the area of the SRWTP plume that is greater than 1–2°F above river background is large in area, thus providing ample space for predatory fishes to congregate. Nevertheless, this study did not find predatory fishes holding within the warmer water of the plume at substantially higher numbers than in other portions of the river lacking such elevated temperatures. Consequently, the CTF thermal plume is not expected to substantially increase predation on emigrating special-status fishes in this reach of the San Juaquin River.

Effects on Phytoplankton, Zooplankton, and BMI and Associated Effects on Critical Habitat for ESA-Listed Fishes

Appendix E provides detailed analyses of how fully mixed (Section 3.2.6) and plume (Section 3.3.3) river temperatures could affect phytoplankton, zooplankton, and BMI. Based on Appendix E findings, fully mixed river temperatures would not cause mortality or chronic, adverse effects on phytoplankton, zooplankton, or BMIs within the river and no lethality or adverse thermal effects would occur for these organisms that drift through the thermal plume near the outfall. Because no adverse thermal effects would occur to individual organisms, no population or community levels effects would occur for phytoplankton, zooplankton, or BMIs. Consequently, the prey base for green sturgeon, steelhead, and delta smelt would not be adversely affected by the CTF discharge effects on river temperatures. Therefore, the thermal effects of CTF discharges on river temperatures would not reduce the quantity or quality and thus value of the food resources physical and biological feature (PBF) for the southern DPS of green sturgeon. For the same reasons, river temperatures with the project would not be elevated by sufficient magnitude to reduce the quantity or quality and thus value of the food resources aspect of the freshwater rearing sites PBF designated for the Central Valley steelhead DPS or the water PBF for delta smelt. Because all other non-special-status fishes also rely upon the river's phytoplankton, zooplankton, and BMI populations as their prey base, and because the fully mixed and thermal plume temperatures associated with CTF discharges would not cause adverse thermal effects on individual prey organisms or to their populations, the CTF discharges would not adversely affect the prey base for any fish species using the San Joaquin River.

Based on the assessment findings provided above, and discussed in greater detail in Appendix E, Section 3.3, the effect of CTF river discharges at 2.5 mgd and 6.0 mgd ADWF on river temperatures within the CTF thermal plume would not have any substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NMFS. The CTF plume temperature effects would not interfere with the movement of any native resident or migratory fish species, reduce the amount of usable aquatic habitat within the affected environment, or result in adverse changes to designated critical habitat for federal ESA-listed species that would reduce the quantity or value of such habitat to the listed species. Plume effects would not result in physical, chemical, or biological conditions that would cause substantial reductions in non-special-status fish populations or abundance of phytoplankton, zooplankton or BMIs or result in a substantial adverse effect on any riparian habitat or other sensitive natural community. Finally, plume temperature effects would not conflict with the provisions of an adopted habitat conservation plan; natural community conservation plan; or other approved local, regional, or state conservation plan that specifically address aquatic species using the affected environment. Based on these determinations, this impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.4-6: Result in Operations-Related Effects on River Flow and Physical Habitat and Associated Impacts on Fish and Other Aquatic Organisms

The proposed project would not reduce or substantially change river flow or wetted physical habitat within the San Joaquin River. The CTF outfall structure constructed within the river channel would not be expected to create sizable areas of hydraulic velocity breaks where predatory fishes such as striped bass would hold and prey upon emigrating special-status fishes as they moved past the outfall. Overall project effects on river flow and physical habitat would be minor and would have no adverse effects on fish or other aquatic organisms. This impact would be **less than significant**.

The proposed project includes discharges of treated effluent into the San Joaquin River, which adds flows to the river. Monthly average CTF discharge rates to the San Joaquin River would range from up to 2.5 mgd (3.9 cubic feet per second [cfs]) in the summer to 3.1 mgd (4.8 cfs) in the winter under 2.5 mgd ADWF discharge conditions. Under 6.0 mgd ADWF discharge conditions, the monthly average discharge rate would range from up to 6.0 mgd (9.3 cfs) in the summer to 7.3 mgd (11.3 cfs) in the winter. The summer CTF discharge rates would increase median river flow rates by approximately 0.6–1.5 percent. The winter CTF discharge rates would increase median river flow rates by approximately 0.2–0.6 percent. These minor additions of flows to the San Joaquin River would not measurably change the channel's wetted width, depth, or flow velocities. Therefore, discharges would have no effect on channel substrates throughout the river. Hence, project discharges would have no effect on the physical width, depth, hydraulics, and substrate of the river. In no case would the proposed project reduce river flows and thus physical wetted habitat available for aquatic biological resources.

The proposed outfall structure to be constructed within the river channel would be relatively small in size and would largely maintain the contours of the channel (see Chapter 2, "Project Description," for a schematic of the outfall structure). Consequently, the outfall structure would not produce large areas of hydraulic velocity breaks where predatory fishes such as striped bass would hold and prey upon emigrating special-status fishes as they moved past the outfall.

Based on these findings, the proposed project would not reduce or substantially change river flow or wetted physical habitat. The minor additional flow added by the CTF discharge and the outfall structure itself would not have a substantial adverse effect through habitat modifications on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NMFS. These minor physical changes would not interfere substantially with the movement of any native resident or migratory fish species, substantially reduce the amount of usable aquatic habitat within the affected environment, cause substantial reductions in non-special-status fish populations or abundance of phytoplankton, zooplankton or BMIs, have a substantial adverse effect on any riparian habitat or other sensitive natural community, or conflict with the provisions of an adopted habitat conservation plan; natural community conservation plan; or other approved local, regional, or state conservation plan that specifically address aquatic species using the affected environment. This impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.4-7: Affect Salmonid Movements or Behavior within the San Joaquin River due to Copper Concentrations in the Effluent Discharge

The CTF discharges would have minor effects on copper concentrations in the San Joaquin River, and river concentrations would always remain below applicable California Toxics Rule criteria and Basin Plan objectives for copper. The organic carbon levels in both the effluent and the river would eliminate any possibility for river copper concentrations to cause inhibition of olfactory function in salmonids migrating through the lower San Joaquin River. Therefore, this is impact would be **less than significant**.

Copper is a naturally occurring element and an essential micronutrient for plants and animals. Sources of copper in the aquatic environment include natural sources, mine drainage, wastewater discharges and stormwater runoff. In the aquatic environment, copper can be present in the dissolved form or bound to organic or inorganic materials in water or sediment. Copper in the dissolved form is more bioavailable (than total recoverable copper) to aquatic organisms, including algae, plants, invertebrates, and fish. The most bioavailable form of copper in the aquatic environment is the free copper ion ($Cu^{2+}$). Excessive amounts of bioavailable copper in the aquatic environment can cause direct toxicity to aquatic organisms. Dissolved copper can also adversely affect the sensory capabilities of salmonids, which are important for predator avoidance, migration, and reproduction (Hecht et al. 2007).

The effects of copper on fish olfactory performance is important because certain behaviors are mediated by chemoreception in salmonids. These include predator avoidance, contaminant avoidance, food location, imprinting and homing, and reproductive behaviors.

Olfactory performance has been measured in various ways by different researchers (i.e., histopathological, neurophysiological, and behaviors). The majority of studies have used water having hardness less than 40 milligrams per liter (mg/L) (as $CaCO_3$), with most studies conducted at a hardness of 20–25 mg/L. Although dissolved organic carbon (DOC) is not reported for most of these studies, it tends to be low in such soft waters (Kennedy et al. 2012; Hecht et al. 2007).

For histopathological endpoints, the lowest concentrations reported to be associated with morphological damage were 20–25 µg/L dissolved copper. Neurophysiological responses have been observed at concentrations below 5 µg/L dissolved copper (Kennedy et al. 2012). For example, in water with hardness of 20 mg/L, Baldwin et al. (2003) found significant reductions in electro-olfactogram responses in juvenile coho salmon compared to controls at a dissolved copper concentration of only 1 µg/L above the control background of 3 µg/L copper (i.e., at a dissolved copper concentration of 4 µg/L). Sandahl et al. (2007) reported a significant differences from control in inhibition of olfactory response for coho salmon at moderate hardness (120 mg/L) at 2 µg/L dissolved copper, with an EC20 (effective concentration which produces a 20 percent change in the response) reported as 4.4 µg/L dissolved copper. In chum salmon, a significant difference from control was observed at 8 µg/L dissolved copper at low hardness and slightly acid conditions (Sandahl et al. 2006). Hecht et al. (2007) identified benchmark concentrations of 0.18–2.1 µg/L (above control background copper levels), corresponding to reductions in predator avoidance behavior of approximately 8–57 percent. Background dissolved copper levels for this work were up to about 3 µg/L. In short, these studies indicate that salmonid olfactory capabilities can be disrupted by copper concentrations below about 5 µg/L dissolved copper, which can be lower than applicable California Toxics Rule copper criteria (e.g., 9.2 µg/L; Appendix E, Table 11).

However, the bioavailability and toxicity of trace metals (particularly copper) is directly correlated to the concentrations of free metal ions rather than to measured total recoverable copper or dissolved concentrations (the latter of which includes complexed metal ions) in water. Copper in natural surface waters is predominantly complexed by organic substances. In the presence of 2–5 mg/L DOC, the free copper ion concentration is decreased by five to seven orders of magnitude, thereby mitigating its bioavailability and toxicity by complexation (Kennedy et al. 2012). This is shown by the copper biotic ligands model developed by the U.S. Environmental Protection Agency and used to derive site-specific copper criteria based on the site's water chemistry, including DOC levels.

Based on the strong effect that DOC has on the bioavailability of the copper free ion, Kennedy et al. (2012) presented the findings represented here in Table 3.4-4.

**Table 3.4-4 Calculated Median Inhibitory Concentration Values and 95% Confidence Intervals for the Inhibition of Olfactory-Mediated Avoidance Behavior at Various DOC Levels**

| Dissolved Organic Carbon (mg/L) | Acute 4-day Exposure | | Subchronic 14-day Exposure | |
|---|---|---|---|---|
| | IC50 (µg/L) | 95% CI | IC50 (µg/L) | 95% CI |
| 0 | 4.3 | 1.9 – 9.5 | 5.4 | 4.7 – 6.1 |
| 1 | 5.8 | 3.4 – 10 | 6.2 | 2.3 – 16.4 |
| 5 | 30.0 | 19.2 – 46.8 | 21.5 | 17.0 – 27.1 |
| 10 | 43.2 | 20.2 – 92.2 | 25.8 | 10.1 – 331 |
| 20 | 87.5 | 21.6 – 354.2 | 69.4 | 22.0 – 219 |

Notes: µg/L = micrograms per liter; CI = confidence interval; DOC = dissolved organic carbon; IC50 = median inhibitory concentration.

Source: Kennedy et al. 2012

The findings by Kennedy et al. (2012) demonstrate the important effect of DOC in reducing copper bioavailability and thus reducing the effect of copper on olfactory-mediated behaviors in Chinook salmon. Hence, metals (and particularly copper) exhibit the highest toxicity to aquatic organisms in soft water with low DOC.

The CTF produces a high quality effluent (see Section 3.9, "Hydrology and Water Quality," for details), with hard water. The average hardness (as $CaCO_3$) is 213 mg/L with a range between 107 and 275 mg/L. Maximum copper concentrations in the effluent measure 7.33 µg/L with average copper concentrations of 2.76 µg/L. DOC is moderate with average concentrations measured at 4.27 mg/L that range between 2.99 and 6.09 mg/L. When discharging at the maximum effluent concentration of 7.33 µg/L into the San Joaquin River when the river's ambient copper concentration is at its maximum recorded level of 8.6 µg/L, river copper concentrations would decrease under both 2.5 mgd and 6.0 mgd ADWF operational scenarios (Table 3.4-5). Nevertheless, because the river's average copper concentration is 2.80 µg/L and the CTF effluent's maximum concentration is 7.33 µg/L, there would be occasions when CTF discharges could increase river copper concentrations somewhat, despite them always remaining below applicable California Toxics Rule criteria.

**Table 3.4-5 Concentrations of Total Copper in the CTF Effluent and San Joaquin River under Background Conditions and Two CTF Operational Scenarios**

| Maximum CTF Effluent Concentration (µg/L) | River Concentration (µg/L) | | |
|---|---|---|---|
| | Maximum Background | Project at 2.5 mgd ADWF | Project at 6.0 mgd ADWF |
| 7.33 | 8.6 | 8.5 | 8.5 |

Notes: µg/L = micrograms per liter; ADWF = average dry weather flow; CTF = Consolidated Treatment Facility; mgd = million gallons per day.

Source: Appendix F, Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River, Appendices A and B

San Joaquin River DOC levels in the vicinity of the proposed project average 3.4 mg/L (Appendix F, Table 15). Based on the above findings by Kennedy et al. (2012), average DOC concentrations of 3.4 mg/L combined with the assimilative capacity of the lower San Joaquin River eliminates any possibility for copper concentrations in CTF effluent to cause inhibition of olfactory function in salmonids migrating through the lower San Joaquin River. Thus, this impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

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# 3.5 CULTURAL, TRIBAL CULTURAL, AND PALEONTOLOGICAL RESOURCES

This section summarizes the findings of the cultural resources inventory completed by Natural Investigations Company (Natural Investigations) to evaluate the Project. It also presents the results of the paleontological resources assessment completed as part of the same cultural resources inventory (Spillane 2020). This section conforms to the provisions and requirements of federal, state, and local laws and regulations that apply to cultural and paleontological resources. It addresses the potential impacts on cultural/historical, tribal, and paleontological resources that could result from implementation of the Project.

Cultural resources include archaeological sites, districts, buildings, structures, and objects generally older than 50 years and considered to be important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Significant cultural resources are generally defined as those that are listed or have been determined eligible for listing in the National Register of Historic Places (NRHP) ("historic properties") or the California Register of Historical Resources (CRHR) ("historical resources"). Historical resources may also include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe ("tribal cultural resources" [TCRs]). Paleontological resources include any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth.

One comment letter regarding cultural resources was received in response to the Notice of Preparation. The Native American Heritage Commission requested Assembly Bill (AB) 52 and Senate Bill (SB) 18 compliance information. SB 18 does not apply as the project does not include a General Plan amendment (which is the trigger for SB 18 compliance). AB 52 compliance is described below.

## 3.5.1 Regulatory Setting

### FEDERAL

#### National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966 establishes the NRHP, and defines federal criteria for determining the historical significance of archaeological sites, historic buildings, and other resources. To be eligible for inclusion in the NRHP, a resource must meet at least one of the following four historical significance criteria (delineated at 36 Code of Federal Regulations Part 60.4) and must also possess sufficient deposition, and architectural or historic integrity to retain the ability to convey the resource's historic significance. Those resources determined to meet these criteria are eligible for listing in the NRHP and are termed "historic properties." A resource may be eligible for NRHP listing at the local, state, or national level of significance.

A resource is eligible for NRHP inclusion if it possess integrity of location, design, setting, materials, workmanship, feeling, and association, and it:

A) Is associated with events that have made a significant contribution to the broad patterns of our history; or

B) Is associated with the lives of persons significant in our past; or

C) Embodies the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D) Has yielded or may be likely to yield, information important in prehistory or history.

To retain historic integrity a property will always possess several and usually most aspects that demonstrate integrity, and generally would retain most aspects of that integrity. The retention of specific aspects of integrity is paramount for a property to convey its significance. Determining which of these aspects are most important to a particular property requires knowing why, where, and when the property is significant. A resource that lacks integrity or does not meet one of the NRHP criteria is not considered a historic property under federal law, and effects to such a resource are not considered significant under the NHPA.

## STATE

### California Register of Historical Resources

The Public Resources Code (PRC) Section 5024.1 establishes the CRHR; sets forth the criteria to determine significance (detailed below); defines eligible properties; and lists nomination procedures. The CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility for the CRHR are based upon the NRHP significance criteria (PRC Section 5024.1[c]). To be eligible for CRHR inclusion, a resource must retain enough of its historic character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance, and must meet at least one of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

As described in PRC Section 5024.1(d), resources that are automatically listed in the CRHR include those listed in or formally determined eligible for listing in the NRHP ("historic properties") and California Historical Landmarks from No. 770 onward. As defined in PRC Sections 5097.9 and 5097.993, Native American historic, cultural, or sacred sites could be listed or eligible for listing in the CRHR pursuant to PRC Section 5024.1.

### California Environmental Quality Act

CEQA is the principal regulatory control addressing whether a project will have a significant effect on the environment, including impacts on historical resources, unique archaeological resources, TCRs, human remains, and paleontological resources in California. Projects with the potential to adversely affect significant cultural resources must be reviewed through the CEQA process. State CEQA Guidelines (14 [CCR Section 15064.5), "Determining the Significance of Impacts to Archaeological and Historical Resources," provide further direction regarding cultural resources. Subsection (a) defines the term "historical resources." Subsection (b) explains when a project may be deemed to have a significant effect on historical resources and defines terms used in describing those situations. Subsection (c) describes CEQA's applicability to archaeological sites and provides a bridge between the application of the terms "historical resource" and a "unique" archaeological resource.

<u>Historical Resources</u>

Under CEQA, the term "historical resource" includes, but is not limited to:

- A resource listed in, or determined to be eligible by the State Historical Resources Commission for listing in the CRHR (PRC Section 5024.1);
- A resource included in a local register of historical resources (as defined by PRC Section 5020.1[k]), or identified in a historical resource survey meeting the requirements of PRC Section 5024.1(g) (presumption of historical significance);

- A resource that meets at least one of the criteria for CRHR listing; or
- A resource that the lead agency otherwise determines is a historical resource as defined by PRC Sections 5020(j) or 5024.1.

State CEQA Guidelines (14 CCR Section 15126.4), "Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects," subsection (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource. Subsection (b) also discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.

#### Unique Archaeological Resources

As noted above, CEQA also requires lead agencies to consider whether projects will affect "unique archaeological resources." PRC Section 21083.2(g) states that "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following three criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

The State CEQA Guidelines note that if an archaeological resource is neither a unique archaeological nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment (CCR Section 15064.5(c)(4)). In practice, most archaeological sites that meet the definition of a unique archaeological resource will also meet the definition of a historical resource.

#### Tribal Cultural Resources

Per AB 52 "tribal cultural resources" are established as a new category of resources under CEQA. As defined under PRC Section 21074, TCRs are "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe" that are either: (1) included or determined to be eligible for inclusion in the CRHR; included in a local register of historical resources as defined in PRC Section 5020.1(k); or (2) determined by the lead agency to be significant pursuant to the criteria for inclusion in the CRHR set forth in PRC Section 5024.1(c), if supported by substantial evidence and taking into account the significance of the resource to a California Native American tribe.

### California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural, and Sacred Sites Act applies to both state and private lands. The Act requires that upon discovery of human remains, construction or excavation activity cease and the county coroner be notified. If the remains are of a Native American, the coroner must notify the Native American Heritage Commission (NAHC), which notifies and has the authority to designate the most likely descendant of the deceased. The Act stipulates the procedures the descendants may follow for treating or disposing of the remains and associated grave goods.

### Health and Safety Code, Sections 7050.5 and 7052

California Health and Safety Code Section 7050.5 requires that if human remains are discovered during construction outside of a dedicated cemetery, the project owner is required to contact the county coroner. Any further excavation or disturbance of land in the vicinity of the discovery must cease until the coroner has made a determination regarding the origin of the remains. If the coroner determines the remains are Native American, the coroner must contact the NAHC within 24 hours and the procedures outlined in PRC Section 5097.98 must be followed. Health and

Safety Code 7052 expressly forbids the willful mutilation, disinterment, removal, or other mistreatments of any remains known to be human without authority of law.

### Public Resources Code, Sections 5097.5 and 5097.9

PRC Section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands." Section 5097.9 prohibits interference with Native American religion or damage to cemeteries or places of worship. Sections 5097.98 through 5097.99 require that the Governor's California NAHC be consulted whenever Native American graves are found. According to these PRC sections, it is illegal to take or possess remains or artifacts taken from Native American graves; however, it does not apply to materials taken before 1984. Violations occurring after January 1, 1988 are felonies.

### Public Resources Code, Section 21080.3

PRC Section 21080.3.1 requires that the lead agency begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the project prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report for a project if the following conditions are met:

1. The California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and
2. The California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation.

## LOCAL

### City of Lathrop General Plan

Although the City of Lathrop is currently updating its General Plan, the existing *City of Lathrop General Plan* is the plan that is currently in effect. The Resource Management Element of the *City of Lathrop General Plan* (2004) contains the following policies that may be applicable to the Project:

<u>Archaeological and Cultural Resource Policies</u>

1. Existing known archaeological and cultural resources are to be protected, beginning with the filing of an application for development in the immediate vicinity of such resources. The City shall follow the procedures set forth in Appendix K of CEQA Guidelines. Confidentiality shall be maintained between the City and developer to avoid vandalism or desecration of such resources. Alternatives for development design intended to protect cultural resources shall be reviewed by a Native American having competence in understanding and interpreting the importance of the resources and of the most desirable methods to assure their preservation.
2. The potential loss of as yet unknown archaeological and cultural resources shall be avoided by close monitoring of the development process. The close proximity of properties intended for development to natural watercourses or to known archaeological or cultural resources shall be taken as a signal by the City and developer of a potential for unearthing unknown resources. In such cases, the City shall instruct the developers, construction foremen and City inspectors of the potential for damage to artifacts and sites, and provide written instructions requiring a halt to all excavation work in the event of any find until the significance of the find can be evaluated by competent archaeological and Native American specialists. The costs of such protection work shall be the responsibility of the developer.

## PALEONTOLOGY

The Impact Mitigation Guidelines published by the Society of Vertebrate Paleontology (SVP) provide a set of standard procedures intended to be applicable to both private and public lands under the jurisdiction of local, city, county, regional, state, and federal agencies (SVP 2010). Protection of paleontological resources includes: (a) assessment of the potential for land to contain significant paleontological resources which could be directly or indirectly impacted, damaged, or destroyed by proposed development and (b) formulation and implementation of measures to mitigate these adverse impacts, including permanent preservation of the site and/or permanent preservation of salvaged fossils along with all contextual data in established institutions.

The SVP Guidelines define the paleontological potential of rock units as high, undetermined, low, or no potential. Sedimentary rock units with a high potential for containing significant nonrenewable paleontological resources are those within which vertebrate or significant invertebrate, plant, or trace fossils have been determined by previous studies to be present or likely to be present. Significant paleontological resources are fossils or assemblages of fossils, which are unique, unusual, rare, uncommon, diagnostically or stratigraphically important, and those which add to the existing body of knowledge in specific areas, stratigraphically, taxonomically, or regionally. Rock units with undetermined potential have little information available concerning their paleontological content, geologic age, and depositional environment. Further study is needed to determine if these rock units have high or low potential to contain significant paleontological resources.

Rock units with low potential are poorly represented by fossil specimens in institutional collections, or preserve fossils in rare circumstances (e.g., basalt flows or recent colluvium). Metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites) generally have no potential to contain significant paleontological resources. Rock units with low or no potential will not typically require impact mitigation measures to protect fossils.

# 3.5.2 Environmental Setting

## REGIONAL PREHISTORY

A tripartite classification scheme for cultural change in California's Sacramento–San Joaquin Valley and Delta was developed as the result of efforts of a number of researchers since the 1930s and has been further refined over the succeeding decades. With the timeframes adjusted for modern calibration curves for radiocarbon dates, the chronological sequence for the Central Valley is: Paleo-Indian (11,500–8550 cal [calibrated] B.C.), Lower Archaic (8550–5550 cal B.C.), Middle Archaic (5550–550 cal B.C.), Upper Archaic (550 cal B.C.–cal A.D. 1100), and Emergent or Late Prehistoric Period (cal A.D. 1100–Historic Contact).

Subsequent to the Paleo-Indian and Lower Archaic periods, the cultural framework within the greater study region is further divided into three regionally based "patterns." Specific to Central Valley prehistory and the current study region, the regionally based patterns are the Windmiller, Berkeley, and Augustine. The patterns mark changes in distinct artifact types, subsistence orientation, and settlement patterns, which began circa 5550 cal B.C. and lasted until historic contact in the early 1800s. In general, the patterns conform to three temporal divisions: Middle Archaic Period/Windmiller Pattern, Upper Archaic Period/Berkeley Pattern, Late Prehistoric Period/Augustine Pattern.

### Paleo-Indian and Lower Archaic Periods (11,500–5550 cal B.C.)

There is little evidence of the Paleo-Indian and Lower Archaic periods in the Central Valley. As shown by geoarchaeological studies, large segments of the Late Pleistocene landscape throughout the central California lowlands have been buried or removed by periodic episodes of deposition or erosion. Periods of climate change and associated alluvial deposition occurred at the end of the Pleistocene (approximately 9050 cal B.C.) and at the beginning of the early Middle Holocene (approximately 5550 cal B.C.). Earlier studies had also estimated that Paleo-Indian and Lower Archaic sites along the lower stretch of the Sacramento River and San Joaquin River drainage systems had been buried by Holocene alluvium up to 33 feet thick that was deposited during the last 5,000 to 6,000 years. The formation of the Sacramento–San Joaquin Delta began during the early Middle Holocene. After approximately 1,000 cal B.C. during the Late Holocene, there were renewed episodes of alluvial fan and floodplain deposition.

The archaeological evidence that is available for the Paleo-Indian Period is comprised primarily by basally thinned, fluted projectile points. In the Central Valley, fluted points have been recovered from remnant features of the Pleistocene landscape at only three archaeological localities (Woolfsen Mound in Merced County, Tracey Lake in San Joaquin County, and Tulare Lake basin in Kings County). In the Central Valley, the Lower Archaic Period is mainly represented by isolated finds. The earliest confirmed archaeological evidence for habitation of the immediate Sacramento vicinity was recovered from a depth of 10-22 feet below current street level with dates for occupation from 8,500 to 3,000 years ago. At Lower Archaic foothill sites in eastern Contra Costa County and Calaveras County, abundant milling slabs and handstones have been recovered.

## Middle Archaic Period/Windmiller Pattern (5550–550 cal B.C.)

For the first 3,000 years of the Middle Archaic, archaeological sites on the valley floor are relatively scarce, in part due to natural geomorphic processes; sites are more common after 2550 cal. B.C. Excavations at Windmiller Pattern sites have yielded abundant remains of terrestrial fauna (deer, tule elk, pronghorn, and rabbits) and fish (sturgeon, salmon, and smaller fishes). Projectile points with a triangular blade and contracting stems are common at Windmiller Pattern sites. A variety of fishing implements such as angling hooks, composite bone hooks, spears, and baked clay artifacts, which may have been used as net or line sinkers, are also relatively common. The presence of milling implements (grinding slabs, handstones, and mortar fragments) indicate acorns or seeds were an important part of the Middle Archaic diet. In the foothills, pine nut and acorn remains have been recovered from sites in Fresno (CA-FRE-61) and Calaveras (CA-CAL-629/630 and CA-CAL-789) counties.

The variety of artifacts recovered from Windmiller Pattern sites includes shell beads, ground and polished charmstones, and bone tools, as well as impressions of twined basketry. Baked clay items include pipes, discoids, and cooking "stones" as well as the net sinkers. Burials in cemetery areas, which were separate from habitation areas, were accompanied by a variety of grave goods. The presence of an established trade network is indicated by the recovery of *Olivella* shell beads, obsidian tools, and quartz crystals. Obsidian sources during the Middle Archaic included quarries in the North Coast Ranges, eastern Sierra, and Cascades.

## Upper Archaic Period/Berkeley Pattern (550 cal B.C.-cal A.D. 1100)

Better understood than any of the preceding periods, the Upper Archaic is characterized by a shift over a 1,000-year period to the more specialized, adaptive Berkeley Pattern. Excavated archaeological sites signal an increase in mortars and pestles, as well as archaeobotanical remains, accompanied by a decrease in slab milling stones and handstones. Archaeologists generally agree mortars and pestles are better suited to crushing and grinding acorns, while milling slabs and handstones may have been used primarily for grinding wild grass grains and seeds. The proportional change indicates a shift during the Berkeley Pattern to a greater reliance on acorns as a dietary staple. Innovations such as new types of shell beads, charmstones, bone tools, and ceremonial blades are additional evidence of the more specialized technology present during this period.

The artifact assemblage in Berkeley Pattern sites demonstrates that populations continued to exploit a variety of natural resources. In addition to seeds and acorns, hunting persisted as an important aspect of food procurement. Large, mounded villages that developed around 2,700 years ago in the Delta region included accumulations of habitation debris and features, such as hearths, house floors, rock-lined ovens, and burials. The remains of a variety of aquatic resources in the large shell midden/mounds that developed near salt or fresh water indicate exploitation of shellfish was relatively intensive.

Berkeley Pattern artifact assemblages are also characterized by *Olivella* shell beads, *Haliotis* ornaments, and a variety of bone tool types. Mortuary practices continue to be dominated by interment, although a few cremations have been discovered at sites dating to this period. Trade networks brought obsidian toolstone to the Central Valley from the North Coast Ranges and the east side of the Sierra Nevada Range.

### Emergent Period/Augustine Pattern (cal A.D. 1100–Historic Contact)

The comprehensive archaeological record for the Emergent or Late Prehistoric Period in the Central Valley shows an increase in the number of archaeological sites associated with the Augustine Pattern in the lower Sacramento Valley/Delta region, as well as an increase in the number and diversity of artifacts. The Emergent Period was shaped by a number of cultural innovations, such as the bow and arrow and more elaborate and diverse fishing technology, as well as an elaborate social and ceremonial organization. Dart and atlatl technology was effectively replaced by the introduction of the bow and arrow. Additionally, the cultural patterns typical of the Augustine Pattern are reflected in the cultural traditions known from historic period Native American groups.

The faunal and botanical remains recovered at Emergent Period archaeological sites indicate the occupants relied on a diverse assortment of mammals, fish, and plant parts, including acorns and pine nuts. Hopper mortars, shaped mortars and pestles, and bone awls used to produce coiled baskets are among the variety of artifacts recovered from Augustine Pattern sites. The toolkit during this period also included bone fish hooks, harpoons, and gorge hooks for fishing, as well as the bow and arrow for hunting. The appearance of ceramics during this period is likely a direct improvement on the prior baked clay industry.

During the Emergent Period, numerous villages ranging in size, were established along the valley floor sloughs and river channels and along the foothills sidestreams. House floors or other structural remains have been preserved at some sites dating to this period (e.g., CA-CAL-1180/H, CA-SAC-29, CA-SAC-267). The increase in sedentism and population growth led to the development of social stratification, with an elaborate social and ceremonial organization. Examples of items associated with rituals and ceremonials include flanged tubular pipes and baked clay effigies representing animals and humans. Mortuary practices changed to include flexed burials, cremation of high-status individuals, and pre-interment burning of offerings in a burial pit. Currency, in the form of clamshell disk beads, also developed during this period together with extensive exchange networks.

## ETHNOGRAPHY

The Project is within the ethnographic territory of the Northern Valley Yokuts, whose core lands were along the San Joaquin River, extending from north of the Calaveras River southward to the upper San Joaquin River, and from the crest of the Coast (Diablo) Range east to the Sierra Nevada foothills. The Northern Valley Yokuts were a Penutian-speaking central California group surrounded by the Southern Valley Yokuts to the south, Salinan to the southwest, Costanoan (Ohlone) to the west, Plains Miwok to the north, Sierran Miwok on the east, and Foothill Yokuts to the southeast. Because of their rapid decimation as a result of disease, missionization, and European American settlement, the Northern Valley Yokuts are not well documented by ethnographers.

The Northern Valley Yokuts consisted of eleven or more tribes that usually held territory on a side of the San Joaquin River or its major tributaries. With a population of around 300, most members of each tribe lived within a single settlement. The settlements frequently had the same name as the political unit. Their villages were generally established on low, natural rises along major watercourses. The eastern side of the San Joaquin River, which had permanent waterways flowing from the Sierra Nevada, was more heavily populated than the lands with semi-permanent watercourses to the west of the river. Village structures included oval, single-family dwellings made of tule, sweathouses, and ceremonial chambers.

A wide variety of tools, implements, and enclosures were used by the Northern Valley Yokuts to collect, gather, and process food resources. Fishing and hunting tools included harpoons, hooks, nets, bow and arrows, traps, and blinds, as well as tule rafts for navigating waterways. Sharpened digging sticks and woven tools such as seed beaters, burden baskets, and carrying nets were used to collect plant resources. Stone mortars and pestles, bedrock and portable mortars, possibly wooden mortars, stone knives and scrapers, and various bone tools were used to process resources. Additional implements and ornamental items, such as mussels and abalone, shell ornaments and beads, bows and arrows, baskets, and obsidian were obtained through trade using the waterways and land trails that led west to the coast.

During the Spanish and Mexican periods, even though there were no non-native settlements in the San Joaquin Valley, native lifeways were affected by the coastal missions and presidios. By 1805, sizeable numbers of Northern Valley Yokuts were transported to the San Juan Bautista, Santa Clara, San José, San Antonio, and Soledad Missions established during the Spanish era. During the Mexican Period many lives were lost to epidemics and military raids. The gold prospectors and farmers of the early American Period later displaced many remaining native populations.

# HISTORIC SETTING

## Regional History

Post-contact California history is divided into three distinct periods: the Spanish Period (1769–1822), the Mexican Period (1822–1848), and the American Period (1848–present). Although there were brief visits by Spanish, Russian, and British explorers from 1529 to 1769, the first significant non-indigenous settlement in California was established by the Spanish at San Diego in 1769. The Spanish expeditions into the Central Valley in 1806 and 1808 led by Lieutenant Gabriel Moraga explored along the main rivers, including the American, Calaveras, Cosumnes, Feather, Merced, Mokelumne, Sacramento, San Joaquin, and Stanislaus.

The American Period was initiated in 1848 with the signing of the Treaty of Guadalupe Hidalgo, which ended the Mexican–American War (1846–1848) and incorporated California as a territory of the United States. Gold was discovered at Sutter's Mill on the American River in Coloma the same year, and by 1849, nearly 90,000 people had journeyed to the gold fields to share in the riches. In 1850, largely as a result of the Gold Rush, California became the thirty-first state. Four years later, the bustling boomtown of Sacramento became the state capital. In contrast to the economic boom and population growth that enabled statehood, the loss of land and territory (including traditional hunting and gathering locales), malnutrition, starvation, and violence contributed to the further decline of indigenous Californians from the Northern California coast to the Sierra Nevada foothills.

The City of Lathrop was established by Leland Stanford, one of four founders of the Central Pacific Railroad, as a railroad stop intended to bypass Stockton. It was named after Stanford's brother-in-law, Charles Lathrop. On September 6, 1869, four months after the golden spike ceremony of the first transcontinental railroad at Promontory Summit, the San Joaquin River Bridge at Mossdale crossing in Lathrop was finished by the Western Pacific Railroad. With its construction the last link of the transcontinental railroad to the Pacific coast was completed. The first through train from Sacramento arrived that evening at the Alameda Wharf in San Francisco Bay. By 1871, Lathrop had its own post office and on July 1, 1989 the City was incorporated. With a population of 23,284 (as of 2018), Lathrop continues to grow today, with educational services, sales, transportation, manufacturing, and farming being the most significant employment industries.

## Project Site History

Historical aerial photographs show that the project vicinity was used largely for agriculture prior to the 1960s. The Reclamation District 17 (RD 17) West Levee (P-39-005086) was constructed along the eastern bank of the San Joaquin River in 1864. It is approximately 14.27 miles long and has been subject to extensive alterations and reconstructions since that time. The first significant development of the project site followed the purchase of 874 acres of land on East Louise Avenue by the Libby-Owens Ford Company (LOF) in 1959. The LOF planned to develop a float glass manufacturing facility there in anticipation of the closure of its glass plant in Ohio. The new glass plant in Lathrop was completed in 1961 and was one of eleven glass production facilities operated by the company nationwide. Newspapers from the time indicate that the Teichert Construction Company was excavating for the LOF plant in Lathrop in 1963, perhaps for the construction of the two settling basins south of the plant at the present location of the City-owned CTF. Alternatively, the excavation may have been for the installation of the LOF pipeline which extends along present day Tesla Way, Harlan Road, and Sadler Oak Drive, or for other facility improvements. Whatever the case may be, historical sources confirm that the two LOF settling basins were completed and in operation at least by 1968, though they were likely constructed years earlier. The basins probably were used to receive discharge of liquid waste from the factory to the north. By 1979 LOF had placed at least seven wells in the vicinity of the plant to test groundwater quality.

The LOF facility was purchased by the Pilkington Manufacturing Company in the 1980s, and by 1985 it had as many as 1,200 hourly employees, working three shifts, producing window glass for General Motors automobiles and the construction industry. Nippon Sheet Glass Company acquired the plant in 2006 and ceased operations in Lathrop in 2013 due to the high-cost of replacing outdated equipment and implementing mandated pollution control measures.

Following incorporation in 1989, the City acquired the land south of the plant where the two LOF settling basins had been constructed in the 1960s. By 1993 the location of the Crossroads Wastewater Treatment Plant (WWTP) and CTF, formerly known as the Water Recycling Plant No. 1, was cleared for development. By 2005 the associated wastewater management ponds and structures of the WWTP/CTF were built. By 2009 the CTF has been expanded eastward and the LOF settling basins were built through by Recycled Water Storage Pond S5 which remains in place today.

A water level monitoring station and tide gauge were built at the San Joaquin River west of the project site between 1965 and 1969. The 2012 Lathrop quadrangle shows that South Howland Road, Christopher Way, Nestle Way (now Tesla Way), and Murphy Parkway had been constructed, along with additional storage ponds in the surrounding area. By 2015, railroad extensions were built in the project site vicinity.

# PALEONTOLOGICAL SETTING

The Project is located in the Central Valley geomorphic province in the northern San Joaquin Valley. The landscape of central California is dominated by the Central Valley, which is surrounded by the Sierra Nevada, Coast Ranges, Siskiyou Range, and Tehachapi Range. The northern half of the valley (Sacramento Valley) is drained by the Sacramento River, while the southern half (San Joaquin Valley) is drained by the San Joaquin River. The two rivers converge at the Sacramento–San Joaquin Delta and then flow westward into Suisun Bay.

The San Joaquin River is located on the west end of the project site. The volume of the river is relatively small, but with its South Fork headwaters is the second-longest river in California, exceeded only by the Pit/Sacramento combination. The river extends 393 miles from the Sierra crest to a chain of hydropower projects and then Friant Dam. Diversions have desiccated portions of the lower river which has driven salmon almost to extinction, though restoration is mitigating this effect. The project site is located in the southeastern margins of the Delta and within the Delta Secondary Zone as established by the Delta Protection Act of 1992 (PRC Section 29760 et seq.). The elevation within the project site is approximately 10 feet (3 meters) above mean sea level. The topography in the vicinity is generally flat.

In the Central Valley province, the sedimentary geologic formations vary in age from Jurassic (199 to 144 million years ago) to Quaternary (200 million years ago to present). The older deposits are primarily marine in origin, while the continentally derived, younger sediments were sourced mainly from the Sierra Nevada Range and were deposited in fluvial, alluvial, and lacustrine environments. In the Central Valley, the thickness of sedimentary deposits that fill the Sacramento and San Joaquin valleys to their present elevations varies. Along the eastern valley edge, the deposits are relatively thin, but range to more than 20,000 feet in the south central portion of the valley. The project site is underlain by Holocene-aged (less than 11,700 years old) flood basin (Qb) and river (Qr) deposits.

# RECORDS SEARCHES, SURVEYS, AND CONSULTATION

## Cultural Resources

### Records Search

A California Historical Resources Information System (CHRIS) records search was conducted by the Central California Information Center on the campus of California State University, Stanislaus to determine whether prehistoric or historic features have been previously recorded within the project site, the extent to which the project site has been previously surveyed, and the number and type of cultural features within a 0.5-mile radius of the Project limits. The results of the CHRIS search were returned on April 9, 2020. The archival search of the archaeological and historical records, national and state databases, and historic maps included a number of previous studies and recorded sources.

According to the CHRIS records search 13 prior cultural resource studies have been completed which included portions of the project site, and an additional 33 have been completed outside the project site but within the 0.5-mile record search radius.

The CHRIS search results also indicated that one historic feature has been previously recorded within the project site, and 18 additional cultural features have been previously identified within the 0.5-mile record search radius. The previously recorded feature (P-39-005086) within the project site is a segment of the RD 17 West Levee which extends for approximately 14.27 miles along the eastern bank of the San Joaquin River and marks the western boundary of RD 17. The other cultural features within 0.5 miles of the project site include a multicomponent site (consisting of both pre-historic and historic-era archaeological features), historical railroad segments, structures, barns, and irrigation related features. An existing road that may be used by Project-related traffic bisects the multicomponent site (P-39-000014/141).

## Field Survey

An intensive pedestrian survey of the entire 40-acre project site was conducted by Natural Investigations on April 22 and June 10, 2020. All portions of the project site were surveyed intensively using transects spaced no greater than 15 meters apart. A reconnaissance level survey of all proposed access roads was also conducted during the field visits. During the survey, all visible ground surfaces were carefully examined for cultural material (e.g., flaked stone tools, tool-making debris, stone milling tools, or fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, soil depressions and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), and historic-era debris (e.g., metal, glass, ceramics). Ground disturbances (e.g., animal burrows, dirt roads, etc.) were also visually inspected.

One previously unrecorded cultural feature was identified on the east end of the project site during the field survey; it was designated as NI821-S-001. A 3,715-foot segment of the previously recorded RD-17 West Levee (P-39-005086) is within the project site and was revisited during the field survey. Finally, a multicomponent site made up of a prehistoric village and former residence (P-39-000014/141) is bisected by an unpaved access road that may carry Project-related traffic. While the site is not within the project site, it was revisited during the field survey to determine whether use of the access road could impact the site.

### P-39-14-000014/141

This archaeological site consists of the remains of a prehistoric village occupied from about 1500 to at least the early 18$^{th}$ century and the location of a former historical single-family residence that has since been demolished and removed. The prehistoric component contains two cultural mounds with midden deposits, human interments and associated funerary items, lithics, and faunal assemblages. This component has been disturbed by the construction of the Union Pacific Railroad south of the project site, as well as by the construction of I-5, SR 120, Manthey Road, and other activities. However, intact portions have been found protected underneath artificial fill. Cultural constituents are clearly visible on the surface but do not extend onto the graveled roadway which appears to have been built on top of the site rather than into it. The roadway is actively used by the property owner as well as by railroad and highway maintenance crews.

### NI821-S-001

This historic-era archaeological feature is the site of two former earthen settling basins on the eastern side of the CTF associated with glass manufacture at the LOF glass plant. They were constructed by the LOF Company in the 1960s, probably as a method of treating wastewater by capturing solid wastes. The site has been destroyed almost entirely by the construction of the existing Recycled Water Storage Pond S5 and related infrastructure on the eastern side of the CTF. Cultural remains are limited to a disused and largely demolished pump station and partial footprints of the northern ends of the two former settling basins. Glass shards are also ubiquitous across the site and represent waste material that settled in the former basins prior to the City's acquisition of the property around the time of its incorporation on July 1, 1989. Given the extent of alterations to the area surrounding the site and the severity of impacts to it from past construction, its informational value is low and its integrity has been almost entirely lost. Therefore, the historic-era archaeological feature does not appear to be eligible for listing in either the NRHP or CRHR and therefore, is not a resource under CEQA.

**P-39-005086**

The RD 17 West Levee is a historic feature that extends for approximately 14.27 miles along the eastern bank of the San Joaquin River and marks the western boundary of the RD 17. An approximately 0.7-mile segment of the levee is present within the project site or would otherwise be used for access during Project-related work. The segment has been subject to recent improvements, including the graveling of the levee surface and the installation of erosion control riprap on its western slope. The historic feature was evaluated in 2008; that evaluation concluded that due to extensive modifications, improvements, and reconstruction, among other factors, the feature does not meet eligibility criteria for listing in either the CRHR or the NRHP. Therefore, it is not a resource under CEQA.

#### Sensitivity for the Discovery of Buried Cultural Material

Review of prior studies, site records, historical maps and aerial photographs, survey results, and disturbance history indicates the project site has a low-to-low-moderate potential for the discovery of subsurface archaeological materials, features, or deposits during project implementation. Prehistoric occupation between the San Joaquin River and the eastern end of the project site would typically have occurred on elevated ground slightly away from watercourses. No historic-era residential development of the project site is indicated by historical source material. The proposed project was used agriculturally until being purchased by the LOF Company in 1959. Additionally, the project site has been severely disturbed by 60 years or more of agricultural, industrial, and modern municipal uses, including extensive excavations for the construction of percolation ponds, treatment facilities, ancillary structures, and the installation of various utilities. Together these factors significantly reduce the potential for intact subsurface cultural remains.

## Tribal Cultural Resources

Natural Investigations contacted the NAHC requesting a search of their Sacred Lands File for traditional cultural resources within or near the project site. The results of the search returned by the NAHC on April 3, 2020 were negative for Native American cultural resources in the project vicinity.

The City of Lathrop has initiated consultation in accordance with AB 52. On April 20, 2020, notification letters were sent to the Buena Vista Rancheria Me-Wuk Indians and the North Valley Yokuts Tribe because, in accordance with PRC section 210808.3.1, these two tribes formerly requested that the City provide notification of proposed projects. Under PRC section 21080.3.1, tribes typically have 30 days to respond to notification letters; however, on April 22, 2020, Governor Newsom signed Executive Order (EO) N-54-20 to address the need to extend certain government functions and legal requirements as a result of the March 4 State of Emergency regarding COVID-19. This included a suspension of certain legally mandated timeframes for tribal consultation which were set forth by AB 52. Section 9 of the EO states:

> The timeframes set forth in Public Resources Code sections 21080.3.1 and 21082.3, within which a California Native American tribe must request consultation and the lead agency must begin the consultation process relating to an Environmental Impact Report, Negative Declaration, or Mitigated Negative Declaration under the California Environmental Quality Act, are suspended for 60 days.

As a practical matter, consultation timeframes for tribes to request consultation and for lead agencies to begin the consultation process are suspended for 60 days to June 21, 2020. Neither the Buena Vista Rancheria Me-Wuk Indians nor the North Valley Yokuts Tribe responded to the notification letters by June 21.

## Paleontological Resources

Natural Investigations conducted a search of the paleontological records maintained by the University of California Museum of Paleontology (UCMP) on April 21, 2020. The records search included a review of the UCMP's specimen catalog for Lathrop and greater San Joaquin County. The UCMP database indicates that 100 fossil localities have been recorded within San Joaquin County (Spillane 2020). The localities are mainly south of I-205, along the I-580 corridor and the Delta-Mendota Canal, and the slopes of the Diablo Range foothills. Nearly two-thirds of the localities contain vertebrate fossils; 18 have produced Middle to Late Pleistocene-aged Rancholabrean fauna (450,000 to 11,000 years), with the remaining vertebrate specimens from older Late Jurassic, Miocene, and Pliocene-aged deposits (Franciscan, San Pablo, Mehrten, and Neroly formations; 163 to 2.6 million years). None of these geologic rock units occur in the project site.

The SVP defines four levels of paleontological sensitivity: *High*, *Low*, *Undetermined*, and *No Potential*. High Potential geologic units are those from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered. These are regarded as having high potential to contain additional significant paleontological resources. Low Potential geologic units are those that are poorly represented by fossil specimens in institutional collections, or that are known to preserve fossils only in rare circumstances. Undetermined Potential geologic units are those for which little or no information is available concerning their paleontological content, geologic age, and depositional history. No Potential geologic units such as high-grade metamorphic rocks (e.g., gneisses and schists) and plutonic igneous rocks (e.g. granites and diorites) are those that would not preserve fossil resources under any circumstances.

Holocene-aged (less than 11,700 years old) flood basin (Qb) and river (Qr) deposits such as those underlying the project site, are considered to have a low paleontological potential because they are geologically immature and, therefore, unlikely to have fossilized the remains of organisms (fossilization processes take place over millions of years). These low sensitivity Holocene deposits are known to extend to considerable depths, up to 20,000 feet in the south-central portion of the valley, so the proposed project is not likely to disturb any underlying geologic units. No unique geologic features are known to underlie the project site. Taken together, these factors indicate that the paleontological resource sensitivity of the project site is low.

# 3.5.3 Environmental Impacts and Mitigation Measures

## ANALYSIS METHODOLOGY

This impact analysis is based on the findings of the cultural resources inventory completed for the proposed project (Spillane 2020). The analysis is also informed by the provisions and requirements of federal, state, and local laws and regulations that apply to cultural resources. The proposed project was analyzed in terms of its potential to impact unrecorded and potentially significant cultural resources, including buried human remains and TCRs, within the project site, and its potential to impact unrecorded paleontological resources within the project site.

## THRESHOLDS OF SIGNIFICANCE

An impact related to cultural, tribal cultural, or paleontological resources would be significant if implementation of the proposed project would:

- cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 of the State CEQA Guidelines; or
- cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the State CEQA Guidelines;
- disturb any human remains, including those interred outside of formal cemeteries; or
- cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe; or
- directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Section 15064.5 of the State CEQA Guidelines defines "substantial adverse change" as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be materially impaired. Material impairment includes changes to the physical characteristics that make a historical resource eligible for listing in the CRHR such that the resource would no longer be eligible for the NRHP, CRHR, or local historical registers (CEQA Guidelines, 14 CCR Section 15064.5 [b][2]).

Section 21083.2 of CEQA defines "unique archaeological resource" as an archeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets one or more of the following criteria: (1) that it contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information; (2) that it has a special and particular quality, such as being the oldest of its type or the best available example of its type; or (3) that it is directly associated with a scientifically recognized important prehistoric or historic event or person.

PRC Section 21074 defines “tribal cultural resources” as “sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe” that are listed or determined eligible for CRHR listing, listed in a local register of historical resources, or otherwise determined by the lead agency to be a TCR. A TCR may also be a “historical resource,” “unique archaeological resource,” or a “nonunique archaeological resource.”

For the purposes of the impact discussion, “historical resource” is used to describe built-environment historic-period resources. Archaeological resources (both prehistoric and historic-era), which may qualify as “historical resources” pursuant to CEQA, are analyzed separately from built-environment historical resources.

## IMPACT ANALYSIS

### Impact 3.5-1: Cause a Substantial Adverse Change in the Significance of Historical Resources

No historic resources pursuant to Section 15064.5 of the State CEQA Guidelines were identified on the project site. There would be **no impact**.

No historical resources were identified on the project site. As described above, historic feature P-39-005086, the RD 17 West Levee, a portion of which would be affected during installation of the pipeline through the levee and construction of the new outfall, has been evaluated and found not eligible for listing in the CRHR or NRHP. As a result, it would not be considered significant for the purposes of CEQA. Thus, project construction and operation would have **no impact** on historical resources.

### Impact 3.5-2: Cause a Substantial Adverse Change in the Significance of Archaeological Resources

Although no archaeological resources have been identified on the project site, project-related ground-disturbing activities could result in the discovery or damage of previously undiscovered archaeological resources as defined in State CEQA Guidelines Section 15064.5. This would be a **potentially significant** impact.

Review of prior studies, site records, historic maps, aerial photographs, survey results, and disturbance history indicates the project site has a low-to-low-moderate potential for the discovery of previously unrecorded subsurface archaeological resources, features, or deposits during project implementation. Prehistoric occupation between the San Joaquin River and the eastern end of the project site would typically have occurred on elevated ground slightly away from watercourses. No historic-era residential development of the project site is indicated by historical source material. Historical aerial photographs indicate that much of the Project was used agriculturally until being purchased by the LOF Company in 1959. Additionally, the project site has been severely disturbed by 60 years or more of agricultural, industrial, and modern municipal uses, including extensive excavations for the construction of settling basins, treatment facilities and ancillary structures, and the installation of various utilities. As described previously, the archaeological feature present within the project site, the Libby-Owens Ford Water Treatment Site (NI821-S-001), does not appear to be eligible for listing in the CRHR or NRHP and therefore does not qualify as a unique archaeological resource under CEQA. A second archaeological site, P-39-14-000014/141, is located outside the project site but is bisected by an unpaved road that may be used to access portions of the project site. This site has not been evaluated for CRHR- or NRHP-eligibility, so it is unknown whether this site could qualify as a unique archaeological resource under CEQA. However, as described previously, cultural constituents do not extend onto the graveled roadway which appears to have been built on top of the site rather than into it. Additionally, the roadway is currently in use, therefore, any additional use of the road for project access would not likely cause any impact to P-39-14-000014/141.

Although no CRHR-listed or unique archaeological resources have been documented in the project site, the proposed project is located in a region where significant prehistoric and historic-era archaeological resources have been recorded and there remains a potential that unrecorded archaeological resources could be unearthed or otherwise discovered during ground-disturbing activities. Prehistoric or ethnohistoric materials might include flaked stone tools, tool-making debris, stone milling tools, shell or bone items, and fire-affected rock or soil darkened by cultural activities (midden); examples of significant archaeological discoveries would include villages and cemeteries. Historic-era materials might include metal, glass, or ceramic artifacts; examples of significant discoveries might include former privies or refuse pits. Due to the possible presence of unrecorded archaeological materials within the project site, construction-related impacts on unique archaeological resources would be **potentially significant**.

## Mitigation Measures

### Mitigation Measure 3.5-2: Implement Inadvertent Discovery Measures for the Protection of Archaeological Resources

If any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil ("midden"), that could conceal cultural deposits are inadvertently discovered during project-related construction activities, all ground-disturbances within a minimum of 50 feet of the find shall be halted until a qualified professional archaeologist can evaluate the discovery. The archaeologist shall examine the resources, assess their significance, and recommend appropriate procedures to the lead agency to either further investigate or mitigate adverse impacts (e.g., adverse effect on a significant historical resource). If the qualified archaeologist determines the archaeological material to be Native American in nature, the City shall contact the appropriate California Native American tribe for their input on the preferred treatment of the find. If the find is determined to be a unique archaeological resource and it cannot be avoided, then appropriate procedures to protect the integrity of the resource shall be applied (e.g., preservation in place, data recovery program pursuant to PRC Section 21083.2[i]). During evaluation or mitigative treatment, ground-disturbance and construction work may continue on other parts of the project site.

<u>Significance after Mitigation</u>

Implementation of Mitigation Measure 3.5-2 would ensure that any previously unrecorded archaeological resources inadvertently discovered during project-related ground-disturbance would be properly treated because it would require the performance of professionally accepted and legally compliant procedures for the discovery and protection of previously undocumented significant archaeological resources. Therefore, potentially significant impacts resulting from the inadvertent discovery of unknown archaeological resources during construction would be reduced to a **less-than-significant** level.

## Impact 3.5-3: Cause a Substantial Adverse Change in the Significance of a Tribal Cultural Resource

No TCRs have been documented in the project site, however, project-related ground-disturbing activities could result in the discovery or damage of previously undiscovered TCRs. Newly discovered prehistoric, ethnohistoric, or historic-era archaeological sites could be recognized as TCRs and could be adversely affected during project construction. This impact would be **potentially significant**.

As described previously, the City of Lathrop, sent notification letters to the Buena Vista Rancheria Me-Wuk Indians and the North Valley Yokuts Tribe on April 20, 2020. Neither of the tribes responded; therefore, there was no consultation pursuant to PRC 21080.3.1(b). For these reasons, no part of the project site meets any of the PRC Section 21074 criteria for TCRs.

Based on the more than 60-year history of disturbance within the project site—including disturbances from agricultural, industrial, and municipal uses—the project site has a low to low-moderate potential for the discovery of prehistoric, ethnohistoric, or historic-era archaeological sites that may meet the definition of TCRs. Although no TCRs have been documented in the project site, the proposed project is located in a region where significant resources have been recorded and there remains a potential that unrecorded archaeological resources that may meet the definition of TCRs could be unearthed or otherwise discovered during ground-disturbing construction activities. Due to the possible presence of unrecorded TCRs within the project site, construction-related impacts on TCRs would be **potentially significant**.

## Mitigation Measures

### Mitigation Measure 3.5-3: Implement Inadvertent Discovery Measures for the Protection of Tribal Cultural Resources

Implement Mitigation Measure 3.5-2.

#### Significance after Mitigation

Implementation of Mitigation Measure 3.5-3 would ensure that any previously unrecorded TCRs inadvertently discovered during project-related ground-disturbance would be properly treated by notifying the appropriate California Native American tribe and requiring preservation options and proper care of significant artifacts if they are recovered. Therefore, potentially significant impacts resulting from inadvertent damage or destruction of previously unrecorded TCRs during construction would be reduced to a **less-than-significant** level.

## Impact 3.5-4: Disturb Human Remains

Although there is a low potential for human remains to be discovered during ground-disturbance for the proposed project, construction activities could inadvertently uncover or disturb human remains, including those interred outside of formal cemeteries. This would be a **potentially significant** impact.

No human remains have been identified within the project site and the potential for the presence of unrecorded human remains is generally considered low due to the relative rarity of unrecorded interments. This likelihood is further reduced by the extensive 60-year history of prior disturbance from agricultural and industrial activities and municipal uses. However, the location of grave sites and Native American remains can occur outside of identified cemeteries or burial sites. Therefore, it is possible that unrecorded human remains could be discovered during ground-disturbing activities. If any human remains were unearthed during project construction, the impact would be **potentially significant**.

## Mitigation Measures

### Mitigation Measure 3.5-4: Implement Inadvertent Discovery Measures for the Protection of Human Remains

If human remains are discovered during project-related ground-disturbance, all work within a minimum of 50 feet of the discovery site shall halt immediately. The lead agency shall notify the County Coroner, as stipulated in Section 7050.5 of the California Health and Safety Code. The Coroner shall determine whether the remains are Native American and, if so, contact the NAHC by telephone within 24 hours. The NAHC shall follow the stipulations in Section 5097.98 of the California Public Resources Code, including determination of a most likely descendant. If the NAHC is unable to identify a descendant, the descendant is unable to make a recommendation, or the landowner rejects the recommendation, the NAHC shall mediate any dispute between the parties. Where such mediation fails to provide measures acceptable to the landowner, the landowner shall reinter the human remains and associated funerary items with appropriate dignity on the property, in a location not subject to further subsurface disturbance.

#### Significance after Mitigation

Implementation of Mitigation Measure 3.5-4 would ensure that any unrecorded or inadvertent discoveries of human remains during ground-disturbing activities would be properly mitigated in accordance with the laws of the state. Therefore, potentially significant impacts resulting from inadvertent disturbance of unrecorded human remains during construction would be reduced to a **less-than-significant** level.

## Impact 3.5-5: Disturb Paleontological Resources

**The project site is underlain by geologically immature flood basin (Qb) and river (Qr) deposits which are considered to have a low paleontological potential. Additionally, the low sensitivity Holocene deposits within the project site are known to extend to considerable depths, up to 20,000 feet, so the proposed project is not likely to disturb any underlying geologic units. This would be a less-than-significant impact.**

The UCMP's records search indicates that 100 fossil localities have been recorded within San Joaquin County. The localities are mainly south of I-205, along the I-580 corridor and the Delta-Mendota Canal, and the slopes of the Diablo Range foothills. No documented paleontological resources have been identified within the project site. Based on the geologic immaturity and depth of the basin (Qb) and river (Qr) deposits underlying the project site and the extensive prior disturbances within the project site, the paleontological resource sensitivity of the project site is low. Additionally, the low sensitivity Holocene deposits within the project site are known to extend to considerable depths, up to 20,000 feet; proposed project-related ground-disturbing activities would be relatively shallow in comparison. Therefore, proposed project-related construction is not likely to expose paleontological resources, and this impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

# 3.6 ENERGY

This section evaluates whether implementing the proposed project would result in an environmental impact related to the inefficient, wasteful, or unnecessary consumption of energy and evaluates the proposed project's consistency with applicable plans related to energy conservation or renewable energy. Applicable federal, state, and local policies related to energy demand and supply are summarized below, and energy infrastructure in the project area are described. The capacity of existing and proposed infrastructure to serve the project is evaluated in Section 3.1.1, "Effects Found Not to Be Significant."

## 3.6.1 Regulatory Setting

Energy conservation is embodied in many federal, state, and local statutes and policies. At the federal level, energy standards apply to numerous products (e.g., the U.S. Environmental Protection Agency's EnergyStar™ program) and transportation (e.g., fuel efficiency standards). At the state level, Title 24 of the CCR sets forth energy standards for buildings. Further, the state provides rebates and tax credits for installing renewable energy systems, and its Flex Your Power program promotes conservation in multiple areas. At the local level, individual cities and counties establish policies in their general plans and climate action plans related to the energy efficiency of new development and land use planning and related to the use of renewable energy sources.

### FEDERAL

#### Energy Policy Act of 1992 and 2005

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. The EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. The EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in the EPAct. Federal tax deductions are allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the EPAct to consider a variety of incentive programs to help promote AFVs. The Energy Policy Act of 2005 provides renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

#### Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 is designed to improve vehicle fuel economy and help reduce U.S. dependence on oil. It represents a major step forward in expanding the production of renewable fuels, reducing dependence on oil, and confronting global climate change. It also increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022, which represents a nearly fivefold increase over 2007 levels. It also reduces U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020—an increase in fuel economy standards of 40 percent.

### STATE

#### Warren-Alquist Act

The 1974 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as the California Energy Commission (CEC). The creation of the act occurred as a response to the state legislature's review of studies projecting an increase in statewide energy demand, which would potentially encourage the development of power plants in environmentally sensitive areas. The act introduced state policy for siting power plants to reduce potential environmental impacts and sought to reduce demand for these facilities by directing CEC to develop statewide energy conservation measures to reduce the wasteful, inefficient, and unnecessary uses of energy. Conservation measures recommended establishing design standards for energy conservation in buildings, which ultimately resulted in the creation of the Title 24 Building Energy Efficiency Standards (California Energy Code). These standards are updated regularly and remain in effect today. The act additionally directed CEC to cooperate with the Governor's Office of Planning and Research, the California Natural Resources Agency, and other interested parties in ensuring that a discussion of the wasteful, inefficient, and unnecessary consumption of energy is included in all EIRs required on local projects.

### State of California Energy Action Plan

CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, and conservation; public health and safety; and the maintenance of a healthy economy. The current plan is the 2008 update, which calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assisting public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs, as well as encouraging urban design that reduces vehicle miles traveled and accommodates pedestrian and bicycle access (CEC 2008).

The 2008 update has been supplemented by the *2019 California Energy Efficiency Action Plan*, which includes three goals to drive energy efficiency: doubling energy efficiency savings by 2030, removing and reducing barriers to energy efficiency in low-income and disadvantaged communities, and reducing greenhouse gas (GHG) emissions from the buildings sector (CEC 2019a).

### Integrated Energy Policy Report

Senate Bill (SB) 1389 (Chapter 568, Statutes of 2002) required CEC to "conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The Energy Commission shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety" (PRC Section 25301[a]). This work culminated in preparation of the first integrated energy policy report (IEPR).

CEC adopts an IEPR every 2 years and an update every other year. The 2019 IEPR, which is the most recent IEPR, was adopted January 31, 2020. The 2019 IEPR provides a summary of priority energy issues currently facing the state, outlining strategies and recommendations to further the state's goal of ensuring reliable, affordable, and environmentally responsible energy sources. Energy topics covered in the report include progress toward statewide renewable energy targets and issues facing future renewable development; efforts to increase energy efficiency in existing and new buildings; progress by utilities in achieving energy efficiency targets and potential; ways to improve coordination among the state's energy agencies; ways to streamline power plant licensing processes; results of preliminary forecasts of electricity, natural gas, and transportation fuel supply and demand; future energy infrastructure needs; the need for research and development efforts to further statewide energy policies; and issues facing California's nuclear power plants (CEC 2020).

### Legislation Associated with Electricity Generation

The state has passed legislation requiring the increasing use of renewable energy to produce electricity for consumers. California utilities are required to generate 33 percent of their electricity from renewables by 2020 (SB X1-2 of 2011), 52 percent by 2027 (SB 100 of 2018), 60 percent by 2030 (also SB 100 of 2018), and 100 percent by 2045 (also SB 100 of 2018). More detail about these regulations is provided in Section 3.7, "Greenhouse Gas Emissions and Climate Change."

### Assembly Bill 1007: State Alternative Fuels Plan

Assembly Bill 1007 (Chapter 371, Statutes of 2005) required CEC to prepare a state plan to increase the use of alternative fuels in California. CEC prepared the State Alternative Fuels Plan in partnership with the California Air Resources Board and in consultation with other state, federal, and local agencies. The plan presents strategies and actions California must take to increase the use of nonpetroleum fuels in a manner that minimizes the costs to California and maximizes the economic benefits of in-state production. The plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuel use, reduce GHG emissions, and increase in-state production of biofuels without causing a significant degradation to public health and environmental quality.

#### Legislation Associated with Greenhouse Gas Reduction

The state has passed legislation that aims to reduce GHG emissions. The legislation often has an added benefit of reducing energy consumption. SB 32 requires a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. Executive Order S-3-05 sets a long-term target of reducing statewide GHG emissions by 80 percent below 1990 levels by 2050.

Implementation of the state's legislation associated with GHG reduction will have the co-benefit of reducing California's dependency on fossil fuel and making land use development and transportation systems more energy efficient.

More details about legislation associated with GHG reduction are provided in the regulatory setting of Section 3.7, "Greenhouse Gas Emissions and Climate Change."

### LOCAL

#### City of Lathrop General Plan

The City's 1991 General Plan contains goals and polices pertaining to the City's energy demand and consumption; however, these policies do not pertain to the proposed project (City of Lathrop 2004).

## 3.6.2 Environmental Setting

### PHYSICAL SETTING

#### Electricity and Natural Gas Use

Electric services are provided to the City through Pacific Gas and Electric Company (PG&E). Natural gas is delivered to the City through portions of PG&E's 46,000 miles of natural gas pipelines.

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. One-third of energy commodities consumed in California is natural gas. In 2018, approximately 34 percent of natural gas consumed in the state was used to generate electricity. Large hydroelectric projects generated approximately 11 percent of the electricity used by the state, and renewable energy from solar, wind, small hydroelectric, geothermal, and biomass combustion generated 31 percent (CEC 2019b). In 2017, 33 percent of the electricity PG&E provided its customers was generated by eligible, as defined by CEC) renewable energy resources (i.e., biomass combustion, geothermal, small-scale hydroelectric, solar, and wind), 18 percent by large-scale hydroelectric resources, and 20 percent by natural gas (CEC 2019b). The contribution of in- and out-of-state power plants depends on the precipitation that occurred in the previous year, the corresponding amount of hydroelectric power that is available, and other factors. PG&E is the primary electricity and natural gas service provider in the Bay Area, North Coast, and Central Valley of the state.

The proportion of PG&E-delivered electricity generated from eligible renewable energy sources is anticipated to increase over the next three decades to comply with the SB 100 goals described in Section 3.6.1.

#### Energy Use for Transportation

In 2017, the transportation sector was the largest end-use sector of energy in the state, totaling 40.3 percent, followed by the industrial sector at 23.1 percent, the commercial sector at 18.7 percent, and the residential sector at 18.0 percent (EIA 2018). On-road vehicles use about 90 percent of the petroleum consumed in California. The

California Department of Transportation projected that 495 million gallons of gasoline and diesel were consumed in San Joaquin County in 2015, an increase of approximately 55 million gallons of fuel from 2010 levels (Caltrans 2008).

### Energy Use and Climate Change

Scientists and climatologists have produced substantial evidence that the burning of fossil fuels by vehicles, power plants, industrial facilities, residences, and commercial facilities has led to an increase of the earth's temperature (IPCC 2014; OPR et al. 2019). For an analysis of GHG production and the proposed project's contribution to climate change, refer to Section 3.7, "Greenhouse Gas Emissions and Climate Change."

# 3.6.3 Environmental Impacts and Mitigation Measures

## METHODOLOGY

Energy consumed by the proposed project during construction would include gasoline and diesel fuel, measured in gallons. Gasoline, and some diesel fuel, would be consumed during worker commute trips to and from the project site. Diesel would be consumed to operate heavy-duty equipment, such as dozers, tractors, and pavers; however, the primary consumption of diesel fuel would occur during haul truck trips to and from the project site. Construction-related energy consumption was estimated using the proposed construction equipment and schedule provided for the proposed project (Allwardt, pers. comm., 2020; Millett, pers. comm., 2020), California Emissions Estimator Model (CalEEMod) 2016.3.2 computer program horsepower and load factor assumptions, and emissions factors derived from EMissionFactor (EMFAC) 2017.

Energy consumed during operation would include electricity and direct natural gas consumption, measured in megawatt-hours per year. Natural gas would also be indirectly combusted to generate electricity to meet demand; however, compliance with the Renewable Portfolio Standard would decrease natural gas combustion in the energy sector over time. As described in Chapter 2, "Project Description," implementing the proposed project would increase energy consumption slightly because a pump would be used to inject sodium bisulfite into the effluent stream to provide dechlorination before river discharge. However, this level of energy consumption would be negligible as compared to baseline energy consumption because a one-quarter-horsepower engine would be used for short periods to dose effluent (Reed, pers. comm., 2020).

Energy used for operation, in the form of gasoline and diesel fuel, would not be consumed in greater amounts as compared to baseline conditions. Implementing the proposed project would not require any changes to staffing at the CTF in the near term or beyond that associated with expansion the CTF capacity to accommodate buildout, which was previously addressed in the 2013 CTF IS/MND; therefore, no additional energy consumption associated with vehicle trips would occur from project implementation.

Refer to Appendices B and C for detailed assumptions and modeling results, respectively.

## THRESHOLDS OF SIGNIFICANCE

An impact related to energy would be significant if implementation of the proposed project would:

- result in a potentially significant environmental impact related to the wasteful, inefficient, or unnecessary consumption of energy during project construction or operation or
- conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

# ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

## Impact 3.6-1: Result in the Wasteful, Inefficient, or Unnecessary Consumption of Energy during Project Construction or Operation

Implementing the proposed project would not introduce substantial additional operational energy consumption from electricity, natural gas, gasoline, or diesel fuel consumption. It would result in the consumption of construction-related gasoline and diesel fuel; however, this consumption would facilitate the proposed project's objectives to provide for effluent discharge to the San Joaquin River to support planned growth in the City, provide efficient and cost-effective wastewater services to the City, and maximize the use of recycled water in the City. Therefore, construction energy consumption would not be wasteful, inefficient, or unnecessary. This impact would be **less than significant**.

Appendix F and Appendix G of the State CEQA Guidelines require consideration of the energy implications of a project. CEQA requires implementation of mitigation measures to prevent or reduce the wasteful, inefficient, and unnecessary use of energy. Neither the law nor the State CEQA Guidelines establish thresholds that define when energy consumption is considered wasteful, inefficient, or unnecessary.

The proposed project would not introduce energy consumption from increased electricity or natural gas consumption beyond that required to power a one-quarter-horsepower engine to dechlorinate effluent, nor would it introduce new vehicle trips and result in the combustion of gasoline or diesel fuel. For these reasons, construction-related energy consumption is the focus of this analysis (Reed, pers. comm., 2020).

Most of the construction-related energy consumption would be associated with off-road equipment and the transport of equipment and materials using on-road haul trucks. An estimated 3,500 gallons of gasoline and 1,300,000 gallons of diesel fuel would be used during construction of the proposed project (see Appendix C for a summary of construction calculations). Consumption of diesel fuel would occur primarily from the haul truck trips to and from the project site, as well as the operation of heavy-duty equipment, such as tractors, dozers, and cranes.

The energy needs for project construction would be temporary and are not anticipated to require additional capacity or to substantially increase peak or base period demands for electricity and other forms of energy. Gasoline and diesel would be consumed during worker commute trips. As stated previously, diesel would also be consumed during haul truck trips and operation of heavy-duty equipment. Energy would be required to transport excavated materials. The one-time energy expenditure required to construct the proposed project would be nonrecoverable. There is no atypical construction-related energy demand associated with the proposed project. Nonrenewable energy would not be consumed in a wasteful, inefficient, or unnecessary manner when compared to other construction activity in the region. Moreover, this one-time energy expenditure would facilitate the proposed project's objectives to provide for effluent discharge to the San Joaquin River to support planned growth in the City, provide efficient and cost-effective wastewater services to the City, and maximize the use of recycled water in the City. Therefore, construction energy consumption would not be wasteful, inefficient, or unnecessary.

For the reasons discussed above, implementing the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy. This impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.6-2: Conflict with or Obstruct a State or Local Plan for Renewable Energy or Energy Efficiency

Implementing the proposed project would not generate operational energy demand beyond baseline conditions; it would result in energy consumption during project construction from the combustion of gasoline and diesel fuel. This one-time energy expenditure would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, which generally focus on reducing operational energy demand, not construction-related energy consumption. This impact would be **less than significant**.

As stated previously, implementing the proposed project would result in only a negligible increase in operational energy demand, related to the introduction of a one-quarter-horsepower pump, relative to the energy demand associated with overall CTF operations. Furthermore, additional employees would not be required to operate the improvements proposed by the project; thus, no new vehicle trips and related energy consumption would occur from project implementation. Statewide plans, policies, and initiatives that support the use of operational renewable energy or efficient operational energy use, such as the 2017 California Climate Change Scoping Plan (2017 Scoping Plan) or the triennial updates to Part 6 of the Title 24 California Building Code (California Energy Code), would therefore not apply to the proposed project, nor would implementing the proposed project affect the goals and policies contained therein.

Energy would be consumed during project construction (approximately 3,500 gallons of gasoline and 1,300,000 gallons of diesel fuel) (see Appendix C); however, this one-time energy expenditure would not impede or conflict with an applicable renewable energy or energy efficiency plan. Applicable plans, such as the aforementioned 2017 Scoping Plan, address renewable energy and energy efficiency from an operational perspective with the understanding that construction-related energy consumption is inherently short term. Therefore, construction projects, such as the proposed project, are not the focus of such plans. Because the use of gasoline and diesel fuel during project implementation would be short term and project implementation would not generate notable new operational energy demand, implementing the proposed project would not conflict with a renewable energy or energy efficiency plan. This impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

# 3.7 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

This section presents a summary of the current state of climate change science and greenhouse gas (GHG) emissions sources in California, a summary of applicable regulations, quantification of GHG emissions generated by the proposed project, and discussion about the proposed project's potential contribution to global climate change.

For the purposes of this analysis, GHG emissions are measured as metric tons of carbon dioxide equivalent ($MTCO_2e$). The atmospheric impact of a GHG is based on the global warming potential (GWP) of that gas. GWP is a measure of the heat-trapping ability of one unit of a gas over a certain timeframe relative to one unit of carbon dioxide ($CO_2$). The GWP of $CO_2$ is one (IPCC 2014). Consistent with the methodology used by the California Air Resources Board (CARB) in estimating statewide GHG emissions, GWP values from the Intergovernmental Panel on Climate Change's (IPCC's) Fourth Assessment Report Values were used.

In June 2013, the City of Lathrop adopted the *Consolidated Treatment Facility Project Initial Study/Mitigated Negative Declaration* (2013 CTF IS/MND), which evaluated project-level CEQA authorization for expansion of the CTF treatment capacity to 6 million gallons per day (mgd) and program-level CEQA authorization for an additional 3.1 mgd of treatment capacity, for a total capacity of 9.1 mgd at the CTF. The proposed project and its associated operational emissions are a covered action within the project description of the 2013 CTF IS/MND. For this reason, the analysis prepared for the 2013 CTF IS/MND is incorporated by reference where appropriate.

## 3.7.1 Regulatory Setting

### FEDERAL

In *Massachusetts et al. v. Environmental Protection Agency et al.,* 549 U.S. 497 (2007), the Supreme Court of the United States ruled that $CO_2$ is an air pollutant as defined under the federal Clean Air Act (CAA) and that the U.S. Environmental Protection Agency (EPA) has the authority to regulate GHG emissions. In 2010, EPA started to address GHG emissions from stationary sources through its New Source Review permitting program, including operating permits for "major sources" issued under Title V of the CAA.

In October 2012, EPA and the National Highway Traffic Safety Administration, on behalf of the U.S. Department of Transportation, issued final rules to further reduce GHG emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond (77 *Federal Register* [FR] 62624). These rules would increase fuel economy to the equivalent of 54.5 miles per gallon, limiting vehicle emissions to 163 grams of $CO_2$ per mile for the fleet of cars and light-duty trucks by model year 2025 (77 FR 62630).

However, on April 2, 2018, the EPA administrator announced a final determination that the current standards should be revised. On August 2, 2018, the U.S. Department of Transportation and EPA proposed the Safer Affordable Fuel-Efficient Vehicles Rule (SAFE Rule), which would amend existing CAFE standards for passenger cars and light-duty trucks by increasing the stringency of the standards by 1.5 percent per year from models 2021 through 2026 (NHTSA 2020).

The CAA grants California the ability to enact and enforce more strict fuel economy standards through the acquisition of an EPA-issued waiver. Each time California adopts a new vehicle emission standard, the state applies to EPA for a preemption waiver for those standards. However, Part One of the SAFE Rule, which became effective on November 26, 2019, revokes California's existing waiver to implement its own vehicle emission standard and also established a standard to be adopted and enforced nationwide (84 FR 51310). At the time of preparing this environmental document, the implications of the SAFE Rule on California's future emissions are contingent upon a variety of unknown factors, including legal challenges by California and other states to the revocation of California's waiver.

In June 2019, EPA, under the authority of CAA Section 111(d), issued the Affordable Clean Energy rule, which provides guidance to states on establishing emissions performance standards for coal-fired electric generating units (EGUs). Under this rule, states are required to submit plans to EPA that demonstrate the use of specifically listed retrofit technologies and operating practices to achieve $CO_2$ emission reductions through heat rate improvement (HRI). HRI is a measurement of power plant efficiency that EPA determined as part of this rulemaking to be the best system of emission reductions for $CO_2$ generated from coal-fired EGUs (EPA 2019).

## STATE

### Statewide GHG Emission Targets and Climate Change Scoping Plan

Reducing GHG emissions in California has been the focus of the state government for approximately two decades. GHG emission targets established by the state legislature include reducing statewide GHG emissions to 1990 levels by 2020 (Assembly Bill [AB] 32 of 2006) and reducing them to 40 percent below 1990 levels by 2030 (Senate Bill [SB] 32 of 2016). Executive Order S-3-05 calls for statewide GHG emissions to be reduced to 80 percent below 1990 levels by 2050. Executive Order B-55-18 calls for California to achieve carbon neutrality by 2045 and achieve and maintain net negative GHG emissions thereafter. These targets are in line with the scientifically established levels needed in the United States to limit the rise in global temperature to no more than 2 degrees Celsius (°C), the warming threshold at which major climate disruptions, such as super droughts and faster rising sea levels, are projected; these targets also pursue efforts to limit the temperature increase even further to 1.5°C (United Nations 2015).

*California's 2017 Climate Change Scoping Plan* (2017 Scoping Plan), prepared by CARB, outlines the main strategies California will implement to achieve the legislated GHG emission target for 2030 and "substantially advance toward our 2050 climate goals" (CARB 2017). It identifies the reductions needed by each GHG emission sector (e.g., transportation, industry, electricity generation, agriculture, commercial and residential, pollutants with high GWP, and recycling and waste). CARB and other state agencies also released the January 2019 Draft *California 2030 Natural and Working Lands Climate Change Implementation Plan*, consistent with the carbon neutrality goal of Executive Order B-55-18 (CalEPA et al. 2019).

### Legislation Associated with Electricity Generation

The state has passed legislation requiring the increasing use of renewables to produce electricity for consumers. California utilities are required to generate 33 percent of their electricity from renewables by 2020 (SB X1-2 of 2011), 52 percent by 2027 (SB 100 of 2018), 60 percent by 2030 (also SB 100 of 2018), and 100 percent by 2045 (also SB 100 of 2018).

## LOCAL

### San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is the primary agency responsible for addressing air quality concerns in all of San Joaquin County. Its role is discussed further in Section 3.2, "Air Quality." SJVAPCD also recommends methods for analyzing project-generated GHGs in CEQA analyses and offers multiple potential GHG reduction measures for land use development projects. SJVAPCD developed thresholds of significance to provide a uniform scale to measure the significance of GHG emissions from land use and stationary source projects in compliance with CEQA and AB 32. SJVAPCD's goals in developing GHG thresholds include ease of implementation, use of standard analysis tools, and emissions mitigation consistent with AB 32. However, since the passage of SB 32, which mandates a statewide emissions target of 40 percent below 1990 levels by 2030, SJVAPCD has not developed new thresholds in compliance with this target.

### City of Lathrop General Plan

The City's 1991 General Plan contains goals and polices pertaining to the City's emissions of GHGs in consideration of global climate change; however, these policies do not pertain to the proposed project (City of Lathrop 2004).

# 3.7.2 Environmental Setting

## GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected toward space. The absorbed radiation is then emitted from the earth as low-frequency infrared radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are $CO_2$, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are found to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcing (IPCC 2014).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas most pollutants with localized air quality effects have relatively short atmospheric lifetimes (approximately 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere long enough to be dispersed around the globe. Although the lifetime of any GHG molecule depends on multiple variables and cannot be determined with any certainty, it is understood that more $CO_2$ is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused $CO_2$ emissions, approximately 55 percent are estimated to be sequestered through ocean and land uptake every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused $CO_2$ emissions remain stored in the atmosphere (IPCC 2013).

The quantity of GHGs in the atmosphere responsible for climate change is not precisely known, but it is considered to be enormous. No single project alone would measurably contribute to an incremental change in the global average temperature or to global or local climates or microclimates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative.

## GREENHOUSE GAS EMISSION SOURCES

As discussed previously, GHG emissions are attributable in large part to human activities. The total GHG inventory for California in 2017 was 424 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) (CARB 2019). This is less than the 2020 target of 431 $MMTCO_2e$ (CARB 2019). Table 3.7-1 summarizes the statewide GHG inventory for California by percentage.

**Table 3.7-1 Statewide GHG Emissions by Economic Sector**

| Sector | Percent |
|---|---|
| Transportation | 41 |
| Industrial | 24 |
| Electricity generation (in state) | 9 |
| Agriculture | 8 |
| Residential | 7 |
| Electricity generation (imports) | 6 |
| Commercial | 5 |

Source: CARB 2019

As shown in Table 3.7-1, transportation, industry, and in-state electricity generation are the largest GHG emission sectors.

Emissions of $CO_2$ are byproducts of fossil fuel combustion. Methane, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices, landfills, and forest fires. Nitrous oxide is also largely attributable to agricultural practices and soil management. $CO_2$ sinks, or reservoirs, include vegetation and the ocean, which absorb $CO_2$ through sequestration and dissolution ($CO_2$ dissolving into the water) and are two of the most common processes for removing $CO_2$ from the atmosphere.

The City of Lathrop has not conducted a citywide GHG inventory as of 2020.

## EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature will increase by 3.7 to 4.8°C (6.7 to 8.6 degrees Fahrenheit [°F]) by the end of the century unless additional efforts to reduce GHG emissions are made (IPCC 2014:10). According to *California's Fourth Climate Change Assessment*, with global GHGs reduced at a moderate rate, California will experience average daily high temperatures that are warmer than the historic average by 2.5°F from 2006 to 2039, by 4.4°F from 2040 to 2069, and by 5.6°F from 2070 to 2100, and if GHG emissions continue at current rates then California will experience average daily high temperatures that are warmer than the historic average by 2.7°F from 2006 to 2039, by 5.8°F from 2040 to 2069, and by 8.8°F from 2070 to 2100 (OPR et al. 2019).

Since its previous climate change assessment in 2012, California has experienced several of the most extreme natural events in its recorded history: a severe drought from 2012 through 2016, an almost nonexistent Sierra Nevada winter snowpack in 2014–2015, increasingly large and severe wildfires, and back-to-back years of the warmest average temperatures (OPR et al. 2019). According to the California Natural Resources Agency's *Safeguarding California Plan: 2018 Update*, California experienced the driest 4-year statewide precipitation on record from 2012 through 2015; the warmest years on average in 2014, 2015, and 2016; and the smallest and second smallest Sierra snowpack on record in 2015 and 2014 (CNRA 2018). According to the National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration, 2016, 2017, and 2018 were the hottest recorded years in history (NOAA 2019). In contrast, the northern Sierra Nevada experienced one of its wettest full years on record during the 2016–2017 water year (CNRA 2018). The changes in precipitation exacerbate wildfires throughout California through a cycle of high vegetative growth coupled with dry, hot periods that lower the moisture content of fuel loads. As a result, the frequency, size, and devastation of forest fires increase. In November 2018, the Camp Fire completely destroyed the town of Paradise in Butte County and caused 85 fatalities, becoming the state's deadliest fire in recorded history. Moreover, changes in the intensity of precipitation events following wildfires can also result in devastating landslides. In January 2018, following the Thomas Fire, 0.5 inch of rain fell in 5 minutes in Santa Barbara, causing destructive mudslides formed from the debris and loose soil left behind by the fire. These mudslides resulted in 21 deaths.

As temperatures increase, the amount of precipitation falling as rain rather than snow also increases, which could lead to increased flooding because water that would normally be held in the snowpack of the Sierra Nevada and Cascade Range until spring would flow into the Central Valley during winter rainstorm events. This scenario would place more pressure on California's levee/flood control system (CNRA 2018). Furthermore, in the extreme scenario involving the rapid loss of the Antarctic ice sheet and the glaciers atop Greenland, the sea level along California's coastline is expected to rise 54 inches by 2100 if GHG emissions continue at current rates (OPR et al. 2019).

Temperature increases and changes to historical precipitation patterns will likely affect ecological productivity and stability. The locations of existing habitats may change in response to climatic changes where possible, and those habitats and species that lack the ability to retreat will be severely threatened. Altered climate conditions will also facilitate the movement of invasive species to new habitats, where the invasive species can outcompete native species. Altered climatic conditions dramatically endanger the survival of arthropods (e.g., insects, spiders), which could have cascading effects throughout ecosystems (Lister and Garcia 2018). Conversely, a warming climate may support the populations of other insects, such as ticks and mosquitos, which transmit diseases harmful to human health, such as the Zika virus, West Nile virus, and Lyme disease (European Commission Joint Research Centre 2018).

Changes in temperature, precipitation patterns, extreme weather events, wildfires, and sea-level rise have the potential to threaten transportation and energy infrastructure, crop production, forests and rangelands, and public health (CNRA 2018; OPR et al. 2019). The effects of climate change will also have an indirect adverse impact on the economy as more severe natural disasters cause expensive physical damage to communities and the state.

In addition, adjusting to the physical changes associated with climate change can produce mental health impacts, such as depression and anxiety.

Cal-Adapt is a climate change scenario planning tool developed by the California Energy Commission that downscales global climate model data to local and regional resolution under two emissions scenarios. The Representative Concentration Pathway (RCP) 8.5 scenario represents a business-as-usual future emissions scenario, and the RCP 4.5 scenario represents a future with reduced GHG emissions.

San Joaquin County experienced an annual average high temperature of 73.6°F between 1961 and 1990. Under the RCP 4.5 scenario, the county's annual average high temperature is projected to increase by 4.2°F to 77.8°F by 2050 and increase an additional 1.3°F to 79.1°F by 2099 (CEC 2020). Under the RCP 8.5 scenario, the county's annual average high temperature is projected to increase by 5.2°F to 78.8°F by 2050 and increase an additional 3.3°F to 82.1°F by 2099 (CEC 2020).

San Joaquin County experienced an average precipitation of 13.8 inches per year between 1961 and 1990. Under the RCP 4.5 scenario, the county is projected to experience an increase of 1.6 inches to 15.4 inches per year by 2050 and decrease slightly to 15.3 inches per year by 2099 (CEC 2020). Under the RCP 8.5 scenario, the county is projected to experience an increase of 1.5 inches to 15.34 inches per year by 2050 and increase by 1.4 inches to 15.2 inches per year by 2099 (CEC 2020).

# 3.7.3 Environmental Impacts and Mitigation Measures

## ANALYSIS METHODOLOGY

GHG emissions associated with the proposed project would be generated during project construction and by operation of the project. Estimated levels of construction- and operation-related GHGs are presented below. The proposed project is evaluated for its consistency with adopted regulations, plans, and policies aimed at reducing GHG emissions. These include CARB's 2017 Scoping Plan, the Cap-and-Trade Program, the San Joaquin Council of Government's *Regional Transportation Plan/Sustainable Communities Strategy*, and applicable guidance from SJVAPCD.

### Construction-Related Greenhouse Gas Emissions

Short-term construction-generated GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2, as recommended by SJVAPCD and other air districts in California (CAPCOA 2016). Modeling was based on project-specific information (e.g., construction activity, equipment types, estimated hauling trips, worker trips) where available; assumptions based on typical construction activities; and default values in CalEEMod that are based on the project's location and land use type. Construction of the proposed project was assumed to commence in spring 2021 and be completed by fall 2022, when the project would become operational. Two phases of construction (i.e., effluent pipeline from CTF to landside levee toe and CTF modifications) would occur within a single year (i.e., 2021) and construction of the levee crossing and outfall and Ponds A, B, and C decommissioning would occur during the subsequent year (i.e., 2022). While it is expected that decommissioning of Ponds A, B, and C would occur at a future date following the completion of the construction of the levee crossing and outfall, modeling assumed that pond decommissioning would be completed in 2022 to provide a more conservative estimate. GHG emissions were consolidated by year, where appropriate.

### Operational Greenhouse Gas Emissions

Indirect project-related operational emissions of GHGs would occur from consumption of electricity and natural gas at the CTF facility. The proposed project involves expansion of CTF capacity to 5.2 mgd. The 2013 CTF IS/MND evaluated the increase in facility emissions associated with an increase in treatment capacity up to 6 mgd at a project level of analysis. Implementation of the proposed project would not require any changes to staffing at the CTF; therefore, there would be no new transportation-related emissions associated with project buildout. Similarly, indirect emissions associated with electricity consumption were not estimated because energy demand would essentially be the same as the demand associated with the existing CTF and recycling system operations. Although implementation of the *Lathrop Water, Wastewater, and Recycled Water Master Plan* (Master Plan), of which the proposed project is a component, could require additional employees and energy demand, resulting in direct and indirect GHG emissions, these emissions were previously evaluated in the 2013 CTF IS/MND and are incorporated by reference. Implementing the proposed project also would not require the use of landscaping equipment and would not generate solid waste.

## THRESHOLDS OF SIGNIFICANCE

The issue of global climate change is inherently a cumulative issue because the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the proposed project's impact on climate change is addressed only as a cumulative impact.

The significance criteria used to evaluate project impacts on climate change under CEQA are based on Section 15064 of the CEQA statute and relevant portions of Appendix G of the State CEQA Guidelines, which recommend that a lead agency consider a project's consistency with relevant adopted plans and discuss any inconsistencies with applicable regional plans, including plans to reduce GHG emissions. Implementing the proposed project would result in a cumulatively considerable contribution to climate change if it would:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or
- conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

SJVAPCD policy provides for a tiered approach in assessing significance of project-specific GHG emission increases, as follows:

- Projects complying with an approved GHG emission reduction plan or GHG mitigation program that avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less-than-significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA-compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement best performance standards (BPSs).
- Projects implementing BPSs would not require quantification of project-specific GHG emissions. Consistent with the State CEQA Guidelines, such projects would be determined to have a less-than-significant individual and cumulative impact related to GHG emissions.
- Projects not implementing BPSs would require quantification of project-specific GHG emissions and demonstration that project-specific GHG emissions would be reduced by at least 29 percent, as compared to Business-as-Usual (BAU), including GHG emission reductions achieved since the 2002–2004 baseline period, consistent with GHG emission reduction targets established in the 2017 Scoping Plan. Projects achieving at least a 29-percent GHG emission reduction compared to BAU would be determined to have a less-than-significant individual and cumulative impact related to GHGs.

However, the following analysis does not evaluate emissions using SJVAPCD's recommended thresholds of significance. First, the BAU approach, which entails evaluating a project's emissions in the context of AB 32's 2020 GHG reduction goal against an unregulated BAU scenario, was invalidated by the California Supreme Court in *Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming* (2015) 224

Cal.App.4th 1105. The court concluded that "the Scoping Plan nowhere related that statewide level of reduction effort to the percentage of reduction that would or should be required from individual projects." In consideration of the California Supreme Court's decision, the BAU method (i.e., 29 percent below unregulated emissions) is not an appropriate threshold of significance.

Second, the BPSs recommended by SJVAPCD are intended to reduce operational GHG emissions. The proposed project would not introduce new mobile, energy, area, or solid waste operational sources of GHG emissions; rather, it would generate one-time emissions of GHGs during construction activities. Moreover, the BPSs developed by SJVAPCD are not applicable to the types of equipment operated at wastewater treatment facilities. Thus, the GHG emissions associated with water treatment could not be reduced simply through the application of BPSs.

Therefore, GHG emissions will be evaluated against a bright-line threshold. However, SJVAPCD has not developed a bright-line threshold of significance for stationary sources. Thus, thresholds developed and accepted by other air districts in the state will be applied. For instance, the Bay Area Air Quality Management District and South Coast Air Quality Management District recommend that operational GHG emissions from stationary sources be compared to a 10,000 $MTCO_2e$ per year threshold of significance.

The 10,000 $MTCO_2e$ per year threshold originated from the state's Cap-and-Trade Program as the minimum emissions level that would trigger a stationary source's requirement to report emissions to CARB. Although this threshold is generally intended for ongoing sources of emissions (e.g., manufacturing facilities, refineries), this use in CEQA is appropriate for construction projects that occur over a relatively short period and contribute a relatively low total amount of GHGs as compared to a land use development project that would generate annual emissions indefinitely.

Thus, as a component of the existing CTF, which is a stationary source of air pollution and GHG emissions, a stationary bright-line threshold would be an appropriate threshold of significance to evaluate the proposed project's contribution to global climate change. For the reasons stated above, the proposed project would have a potentially significant contribution to global climate change if it were to:

- generate a combined total of amortized construction and operational emissions in exceedance of 10,000 $MTCO_2e$ per year.

## ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### Impact 3.7-1: Potential to Generate GHG Emissions During Construction and Operation of the Proposed Project

Amortized project-generated construction emissions would total 49 $MTCO_2e$, and project operation would result in 8,453 $MTCO_2e$ per year, resulting in a combined total of 8,502 $MTCO_2$ per year. These levels of emissions would not exceed the applicable stationary bright-line threshold of 10,000 $MTCO_2e$ per year. This impact would be **less than significant**.

Construction-related activities would generate GHG emissions from the use of heavy-duty off-road equipment, materials transport, and worker commute trips. Based on modeling conducted for the proposed project, construction is estimated to generate a total of 973 $MTCO_2e$ of GHG emissions for the duration of construction activities (2021–2022) (Table 3.7-2). Total GHG emissions during the 1.5-year construction period are estimated to be 973 $MTCO_2e$. These emissions were amortized over a 20-year period (the assumed lifetime of the proposed project) and estimated to be 49 $MTCO_2e$ per year. Table 3.7-2 shows total construction emissions generated over the course of completing construction activities for the proposed project. Refer to Appendices B and C for construction assumptions and detailed input parameters and results, respectively.

**Table 3.7-2 Construction-Generated Greenhouse Gas Emissions**

| Construction Year | Total $MTCO_2e$ |
|---|---|
| 2021 | 713 |
| 2022 | 260 |
| **Total construction GHG emissions** | **973** |
| **Amortized construction emissions ($MTCO_2e$ per year)[1]** | **49** |

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent

See Appendix B for construction assumptions and Appendix C for detailed input parameters and modeling results.

[1] Construction emissions were amortized over a 20-year period, which represents the lifetime of the proposed project.

Source: Modeled by Ascent Environmental in 2020

Implementing the proposed project could result in an expanded capacity to treat up to 5.2 mgd. Expansion to 6 mgd was evaluated in the 2013 CTF IS/MND and estimated to result in construction-related emissions of 99 $MTCO_2e$ per year and operational emissions of 696 $MTCO_2e$ per year from treatment processes.

Implementing the proposed project would not require any changes to staffing at the CTF or to power, telecommunications, gas, water supply, recycled water distribution, or sewer infrastructure in the near term. CTF operations would continue to be monitored and controlled using the existing Supervisory Control and Data Acquisition system in the administration building at the CTF. Because there would be no changes in staffing, transportation emissions would not occur above baseline levels. Therefore, implementation of the proposed project would not generate transportation-related GHG emissions in the near term. However, as stated previously, implementation of the Master Plan could result in additional new employees that would directly generate GHG emissions in the long term. This level of emissions was evaluated in the 2013 CTF IS/MND and estimated to be 45 $MTCO_2e$ per year.

Energy demand would be essentially the same as the demand associated with the existing CTF and recycled water system operations. At buildout of the CTF, energy demand associated with pumping to the river would increase relative to energy demand associated with development at the time of project completion. However, energy use associated with discharge to the river at buildout, except for an increase in energy use associated with the dechlorination system during river discharge, would be essentially the same as the demand associated with discharge of the effluent to land, which was previously evaluated in the 2013 CTF IS/MND (City of Lathrop 2013). The energy required to power the dechlorination system would be negligible as compared to baseline energy consumption because a one-quarter-horsepower engine would be used for short periods to dose effluent (Reed, pers. comm., 2020). Therefore, the indirect GHG emissions associated with this small increase were not quantified. Nonetheless, in the long term, implementation of the Master Plan would generate new energy demand, resulting in indirect emissions of GHGs. The modeling performed for the 2013 CTF IS/MND estimated energy-related GHG emissions to be 7,350 $MTCO_2e$ per year.

The emissions from these transportation- and energy-related sources (45 $MTCO_2e$ per year and 7,350 $MTCO_2e$ per year, respectively), in addition to emissions associated with stationary source diesel generators and biosolids hauling, totaled 8,453 $MTCO_2e$ per year (Table 3-2 of the 2013 CTF IS/MND). Following the amortization of construction emissions, the total GHG emissions generated by the proposed project in the long term could be 8,502 $MTCO_2e$ per year.

SJVAPCD has not developed a quantitative GHG threshold of significance for operational GHG emissions. Therefore, operational emissions will be evaluated against other adopted thresholds of significance for stationary source emitters. For instance, the Bay Area Air Quality Management District and South Coast Air Quality Management District recommend that operational GHG emissions from stationary sources be compared to a 10,000 $MTCO_2e$ per year threshold of significance (see discussion in the "Thresholds of Significance" section).

As described in Section 1.3, "Tiering from the City of Lathrop Consolidated Treatment Facility Initial Study/Mitigated Negative Declaration and Other EIRs," the expansion of the CTF treatment capacity to 6 MGD was previously analyzed at a project level in the 2013 CTF IS/MND. The 2013 CTF IS/MND considered all impacts related to the construction and operation of the expanded CTF, such as new GHG emissions from transportation, energy consumption, water treatment, stationary sources, and biosolid hauling (Table 3-2 of the 2013 CTF IS/MND), and determined that the expansion of the CTF would result in a less-than-significant impact related to global climate change (City of Lathrop 2013:3-48 through 3-50).

Assuming that the proposed project would be capable of treating 6 mgd at full buildout, total GHG emissions from transportation, treatment processes, energy consumption, stationary sources, and biosolids hauling would total 8,453 $MTCO_2e$ per year. Following the amortization of construction emissions, the total GHG emissions generated by the proposed project would be 8,502 $MTCO_2e$ per year. This level of emissions is below the applicable 10,000 $MTCO_2e$ per year threshold of significance. Therefore, project-related GHG emissions would not be a considerable contribution to global climate change. This impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

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# 3.8 HAZARDS AND HAZARDOUS MATERIALS

This section evaluates the potential for the proposed project to expose construction workers and future receptors to existing and potential hazards and hazardous materials. The analysis contained herein was derived, in part, from a search of government databases, including those under the jurisdiction of the California Environmental Protection Agency (CalEPA), State Water Resources Control Board (SWRCB), and the California Department of Toxic Substances Control (DTSC). The effects of water quality on human health are discussed in Section 3.9, "Hydrology and Water Quality." No comments received on the notice of preparation were related to hazards and hazardous materials.

The project site does not contain any existing hazardous materials sites, including sites on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (i.e., "Cortese List") (CalEPA 2020); therefore, project construction and operation would not result in any disturbance to such sites, and no impact would occur. This issue is not discussed further in this section.

The project site is not located within an airport land use plan or within 2 miles of a public airport or public use airport and, therefore, the proposed project would not result in a safety hazard or excessive noise for people residing or working in the project site. Thus, the proposed project would have no impact related to being located within an airport land use plan and this issue is not discussed further in this section.

The proposed project is not located within 0.25 mile of an existing or proposed school. Mossdale Elementary School is located over 0.3-mile northeast of the proposed pipeline and construction staging area along Inland Passage Way and over 0.3-mile west of the existing pipeline to be replaced at the intersection of Harlan Road and Nestle Way. Lathrop Elementary School is located over 1 mile northeast of the project site. The CTF is located directly adjacent to industrial, vacant, and railroad uses. This site is approximately 1 mile (5,400 feet) from the nearest built-out residential areas (west of I-5, north of Sadler Oak Drive, east of Inland Passage Way), approximately 1.2 miles from the nearest school (Mossdale Elementary), and approximately 2.4 miles from the nearest hospital (St. Dominic's Hospital in Manteca). Implementation of the proposed project would not result in hazardous emissions or handling of hazardous materials, substances, or wastes within 0.25 mile of an existing or proposed school. Thus, the proposed project would have no impact and this issue is not discussed further in this section.

The project site is not located within an area designated as a moderate, high, or very high fire hazard severity zone as designated by the California Department of Forestry and Fire Protection (CAL FIRE 2020). The project site consists of existing urban development, a levee, and the San Joaquin River that would not contribute to potential for wildland fires. For these reasons, the proposed project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. This issue is not discussed further in this section.

## 3.8.1 Regulatory Setting

### FEDERAL

A description of federal regulations related to water quality that are pertinent to hazardous materials is included in Section 3.9, "Hydrology and Water Quality."

#### Management of Hazardous Materials

Various federal laws address the proper handling, use, storage, and disposal of hazardous materials, as well as requiring measures to prevent or mitigate injury to health or the environment if such materials are accidentally released. The U.S. Environmental Protection Agency (EPA) is the agency primarily responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. Applicable federal regulations pertaining to hazardous materials are primarily contained in Code of Federal Regulations (CFR) Titles 29, 40, and 49. Hazardous materials, as defined in the Code, are listed in 49 CFR 172.101. Management of hazardous materials is governed by the following laws.

- The Toxic Substances Control Act of 1976 (15 U.S. Code [USC] Section 2601 et seq.) regulates the manufacturing, inventory, and disposition of industrial chemicals, including hazardous materials. Section 403 of the Toxic Substances Control Act establishes standards for lead-based paint hazards in paint, dust, and soil.
- The Resource Conservation and Recovery Act of 1976 (42 USC 6901 et seq.) is the law under which EPA regulates hazardous waste from the time the waste is generated until its final disposal ("cradle to grave").
- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (also called the Superfund Act or CERCLA) (42 USC 9601 et seq.) gives EPA authority to seek out parties responsible for releases of hazardous substances and ensure their cooperation in site remediation.
- The Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499; USC Title 42, Chapter 116), also known as SARA Title III or the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), imposes hazardous materials planning requirements to help protect local communities in the event of accidental release.
- The Spill Prevention, Control, and Countermeasure (SPCC) rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. The SPCC rule is part of the Oil Pollution Prevention regulation, which also includes the Facility Response Plan rule.

### Transport of Hazardous Materials

The U.S. Department of Transportation regulates transport of hazardous materials between states and is responsible for protecting the public from dangers associated with such transport. The federal hazardous materials transportation law, 49 USC 5101 et seq. (formerly the Hazardous Materials Transportation Act 49 USC 1801 et seq.) is the basic statute regulating transport of hazardous materials in the United States. Hazardous materials transport regulations are enforced by the Federal Highway Administration, the U.S. Coast Guard, the Federal Railroad Administration, and the Federal Aviation Administration.

Hazardous materials are routinely transported on Union Pacific Railroad (UPRR) lines that extend through the City. The Union Pacific Railroad Company implements a security plan in compliance with the Department of Transportation Final Rule 49 CFR Part 172 Hazardous Materials (HM 232): Security Requirements for Offerors and Transporters of Hazardous Materials. The plan includes requirements to enhance the security of transported hazardous materials and ensures proper cleanup procedures in the instance of an accidental release.

### Worker Safety

The federal Occupational Safety and Health Administration (OSHA) is the agency responsible for assuring worker safety in the handling and use of chemicals identified in the Occupational Safety and Health Act of 1970 (Public Law 91-596, 9 USC 651 et seq.). OSHA has adopted numerous regulations pertaining to worker safety, contained in CFR Title 29. These regulations set standards for safe workplaces and work practices, including standards relating to the handling of hazardous materials and those required for excavation and trenching.

## STATE

A description of state regulations related to water quality that are pertinent to hazardous materials is included in Section 3.9, "Hydrology and Water Quality."

### Management of Hazardous Materials

In California, both federal and state community right-to-know laws are coordinated through the Governor's Office of Emergency Services. The federal law, SARA Title III or EPCRA, described above, encourages and supports emergency planning efforts at the state and local levels and providing local governments and the public with information about potential chemical hazards in their communities. Because of the community right-to-know laws, information is collected from facilities that handle (e.g., produce, use, store) hazardous materials above certain quantities. The provisions of EPCRA apply to four major categories:

- emergency planning,
- emergency release notification,
- reporting of hazardous chemical storage, and
- inventory of toxic chemical releases.

The corresponding state law is Chapter 6.95 of the California Health and Safety Code (Hazardous Materials Release Response Plans and Inventory). Under this law, qualifying businesses are required to prepare a Hazardous Materials Business Plan, which would include hazardous materials and hazardous waste management procedures and emergency response procedures, including emergency spill cleanup supplies and equipment. At such time as the applicant begins to use hazardous materials at levels that reach applicable state and/or federal thresholds, the plan is submitted to the administering agency.

The DTSC, a division of CalEPA, has primary regulatory responsibility over hazardous materials in California, working in conjunction with EPA to enforce and implement hazardous materials laws and regulations. As required by Section 65962.5 of the California Government Code, DTSC maintains a hazardous waste and substances site list for the state, known as the Cortese List. Individual regional water quality control boards (RWQCBs) are the lead agencies responsible for identifying, monitoring, and cleaning up leaking underground storage tanks (USTs). The Central Valley RWQCB has jurisdiction over the project site.

## Transport of Hazardous Materials and Hazardous Materials Emergency Response Plan

The State of California has adopted U.S. Department of Transportation regulations for the movement of hazardous materials originating within the state and passing through the state; state regulations are contained in 26 CCR. State agencies with primary responsibility for enforcing state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). Together, these agencies determine container types used and license hazardous waste haulers to transport hazardous waste on public roads. The following provisions are included in the California Vehicle Code (CVC) and pertain to the transportation of hazardous related materials that could potentially be related to the proposed project:

- It is illegal to transport explosives or inhalation hazards on any public highway not designated for that purpose, unless the use of the highway is required to permit delivery of, or the loading of, such materials (Section 31602(b) and Section 32104(a)).
- When transporting explosives through or into a city for which a route has not been designated by the CHP, drivers must follow routes as may be prescribed or established by local authorities (Section 31614(a)).
- Inhalation hazards and poison gases are subject to additional safeguards. These materials are highly toxic, spread rapidly, and require rapid and widespread evacuation if there is loss of containment or a fire. The CHP designates through-routes to be used for the transportation of inhalation hazards (Section 32100 and Section 32102(b)).

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local governments and private agencies. Response to hazardous materials incidents is one part of the plan. The plan is managed by the Governor's Office of Emergency Services, which coordinates the responses of other agencies in the vicinity of the project site.

## Management of Construction Activities

Through the Porter-Cologne Water Quality Control Act and the National Pollution Discharge Elimination System (NPDES) program, RWQCBs have the authority to require proper management of hazardous materials during project construction. For a detailed description of the Porter-Cologne Water Quality Control Act, the NPDES program, and the role of the Central Valley RWQCB, see Section 3.9, "Hydrology and Water Quality."

## Worker Safety

The California Occupational Safety and Health Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations within the state. Cal/OSHA standards are typically more stringent than federal OSHA regulations and are presented in Title 8 of the CCR. Cal/OSHA conducts on-site evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.

Title 8 of the CCR also includes regulations that provide for worker safety when blasting and explosives are utilized during construction activities. These regulations identify licensing, safety, storage, and transportation requirements related to the use of explosives in construction. Blasting and use of explosives are not anticipated as part of the proposed project.

## LOCAL

### City of Lathrop General Plan

Although the City is currently updating its General Plan, the existing *City of Lathrop General Plan* is the plan that is currently in effect. The Safety Goals and Policies section of the *City of Lathrop General Plan* (2004) contains the following goals and policies that may be applicable to the proposed project:

**GOAL No. 8: Public Safety Hazards.** This goal seeks to accomplish the following:

1. The reduction of loss of life or property due to crime, fire, earthquake, flooding or other disasters or hazards.
2. The provision of adequate medical and emergency services to reduce the effects of natural or manmade disasters.
3. The promotion of citizen awareness and preparedness for emergency/disaster situations or potential for the incidence of crime.
4. The implementation of adequate inter-agency disaster planning.

- **Policy 3:** The City will maintain a street system which is capable of providing access to any fires that may develop within the urban area, and which is capable of providing for the adequate evacuation of residents in the event of an emergency condition of magnitude.
- **Policy 4:** The City will continue to maintain and update emergency service plans, including plans for managing emergency operations, the handling of hazardous materials and the rapid cleanup of hazardous materials spills.
- **Policy 5:** The City will continue to cooperate with the County of San Joaquin and other agencies in pre-disaster planning activities such as evacuation required in the event of a serious breach of an upstream dam capable of flooding the community.
- **Policy 6:** The City will seek to reduce the risks and potential for hazards to the public through planning and zoning practices and regulations which avoid hazardous land use relationships, and by the continued and timely adoption of new-edition building and fire codes.

### San Joaquin County Office of Emergency Services

The San Joaquin County Office of Emergency Services (OES) maintains an Emergency Operations Plan (EOP) that serves as the official emergency plan for San Joaquin County (San Joaquin County 2019a). It includes planned operational functions and overall responsibilities of County departments during an emergency situation. The EOP also contains a threat summary for San Joaquin County, which addresses the potential for natural, technological, and human-caused disasters (County Code, Title 4-3007). The Hazardous Material Area Plan Annex prepared by San Joaquin County ensures compliance with the various statutes, codes, and regulations, as well as provides a framework for managing the hazardous material response throughout San Joaquin County (San Joaquin County 2019b). This plan also outlines the areas of responsibility during a hazardous material incident. OES has published evacuation maps for communities within the county, including the City (San Joaquin County OES 2018). Evacuation routes near the project site include Harlan Road and I-5.

### Certified Unified Program Agency

CalEPA designates specific local agencies as Certified Unified Program Agencies (CUPA), typically at the county level. The San Joaquin County Department of Environmental Health (SJCDEH) is the designated CUPA for San Joaquin

County. SJCDEH is responsible for the implementation of statewide programs within its jurisdiction, including: underground storage of hazardous substances (USTs), Hazardous Materials Business Plan (HMBP) requirements, California Accidental Release Prevention (Cal-ARP) program, etc. Facilities are required to complete an HMBP if they handle reportable quantities of hazardous materials at any given time in the year. Reportable quantities are 500 pounds for a solid and 55 gallons for a liquid. Implementation of these programs involves permitting, inspecting, providing education/guidance, investigations, and enforcement.

# 3.8.2 Environmental Setting

## DEFINITION OF HAZARDOUS MATERIALS

The term "hazardous materials" refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). The term "hazardous material" is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment (California Health and Safety Code Chapter 6.95, Section 25501[o]).

If improperly handled, hazardous materials and wastes can cause public health hazards when released to the soil, groundwater, or air. The four basic exposure pathways through which an individual can be exposed to a chemical agent include: inhalation, ingestion, bodily contact, and injection. Exposure can come as a result of an accidental release during transport, storage, or handling of hazardous materials. Disturbance of subsurface soil during construction can also lead to exposure of workers or the public from stockpiling, handling, or transporting soils contaminated by hazardous materials from previous spills or leaks. Hazardous materials may also be present in building materials and released during building demolition activities.

## EXISTING USE AND OCCURRENCE OF HAZARDOUS MATERIALS ON-SITE

Under existing conditions, routine operation of the CTF requires the on-site storage and use of a variety of chemicals in support of the wastewater treatment process and daily operations and maintenance. Chemicals used or otherwise located onsite in reportable quantities are inventoried and reported in accordance with applicable regulations. All chemicals are either consumed during use or disposed of as hazardous waste, in accordance with applicable regulations and requirements. Regulated chemicals used and stored at the CTF are identified in Table 3.8-1.

# 3.8.3 Environmental Impacts and Mitigation Measures

## ANALYSIS METHODOLOGY

The impact analysis provided below is based on a review of applicable laws, permits, and legal requirements pertaining to public health and safety and hazardous materials, as discussed above, and as applicable to the proposed project and the project site. Within this framework, existing on-site chemicals and chemicals usage, hazardous materials, and potential for other safety or hazardous conditions were reviewed based on information available from staff of the existing facility, publicly available hazard and hazardous materials information, site/location and cleanup status information, and other available information. The impact analysis considered potential for changes in the nature, extent, or potential for hazardous conditions to occur onsite, as a result of project construction and operation, including increased potential for exposure to hazardous materials and hazardous conditions. Potential for hazards and hazardous conditions were also reviewed in light of existing hazardous materials management plans and policies, emergency response plans, fire management plans, and applicable regulatory requirements.

## THRESHOLDS OF SIGNIFICANCE

An impact related to hazards and hazardous materials would be significant if implementation of the proposed project would:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- 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; or
- impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

## IMPACT ANALYSIS

### Impact 3.8-1: Create a Significant Health Hazard from the Routine Transport, Use, or Disposal of Hazardous Materials, Including Reasonably Foreseeable Upset or Accidents

Construction activities could potentially result in small fuel or oil spills during equipment refueling or routine maintenance, as well as exposure to previously unknown subsurface contaminants during trenching. Routine transport to, and use of chemicals, including sodium bisulfite, at the CTF to support proposed project operations also could potentially result in exposure to or release of hazardous chemicals. However, to comply with General Plan policies and statewide regulations and minimize the potential to create health hazards, the required spill prevention, containment, and treatment plans would be implemented during construction and site specific plans for Hazardous Substance Spill Prevention and Response, Emergency Action, Fire Prevention, Chemical Management, Hazardous Material Management, and Hazardous Communication would be implemented to support ongoing operations and maintenance. Therefore, construction and operation of the proposed project would not create a significant health hazard from the routine, transport, use, or disposal of hazardous materials or accidental release into the environment. However, because construction activities could encounter undocumented hazardous wastes during trenching activities that could result in a hazard to construction workers, adjacent land uses, and the environment, this impact would be **potentially significant**.

Construction activities associated with the pipeline as part of the proposed project would be located approximately 75 feet from a residential neighborhood in Mossdale Landing South along Sadler Oak Drive and Inland Passage Way. The new side-bank outfall would be located approximately 375 feet from these residences along Inland Passage Way. The CTF is directly surrounded by industrial uses and undeveloped land. The nearest sensitive receptors to the CTF include several residences approximately 0.3-mile to the south and southeast, and 0.5-mile east. The Oakwood Shores residential development is located 0.75-mile south of the CTF and Mossdale Landing South residential development is located 0.8-mile west of the CTF. Additionally, the proposed project would result in discharge of treated effluent from the CTF to the San Joaquin River.

Common hazardous materials used in construction include fuels, solvents, caulking, tar, concrete curing compounds, and asphalt products. Construction-related activities, such as pumping, pouring, emptying, injecting, spilling, and dumping, could also release hazardous materials into the environment. The severity of potential effects varies with the activity conducted and with the concentration and type of hazardous material present. Generally, incidents involving construction-related hazardous materials are small fuel or oil spills that would have a negligible impact on public health. All hazardous materials would be stored, handled, and disposed of according to the manufacturers' recommendations in accordance with applicable regulations. Further, the proposed project would be required to prepare a spill prevention and treatment plan for rapidly, effectively, and safely cleaning up and disposing of any spills or releases that may occur during construction. As required under state and federal law, notification and evacuation procedures for site workers and local residents in the event of a hazardous materials release during construction would be included as part of the plan. In addition, SWRCB Construction General Permit (2009-0009

DWQ) requires spill prevention and containment plans to avoid spills and releases of hazardous materials and wastes into the environment. Inspections would be conducted to verify consistent implementation of general construction permit conditions and the BMPs intended to avoid and minimize the potential for spills and releases and to ensure a response to them, including their immediate cleanup. BMPs include, for example, the designation of special storage areas and labeling, containment berms, and coverage from rain. Compliance with the aforementioned regulations would minimize the potential risk of a spill or accidental release of hazardous materials during construction.

As stated previously, the project site is not identified as a hazardous materials site on any list maintained by CalEPA pursuant to Government Code Section 65962.5. However, the disturbance of undocumented hazardous wastes during trenching activities could result in hazards to the environment and human health. Potential hazards to human health include ignition of flammable liquids or vapors, inhalation of toxic vapors in confined spaces, such as trenches, and skin contact with contaminated soil or water. Federal and state laws require that soils and groundwater having concentrations of contaminants such as lead, gasoline, or industrial solvents that are higher than certain acceptable levels are handled and disposed of as hazardous waste during excavation, transport, and disposal. Title 22 of the CCR, Sections 66261.20–66261.24, contains technical descriptions of characteristics that would cause soil to be classified as a hazardous waste. Additionally, any hazardous waste generated during construction (e.g., diesel fuel, oil, solvents) would be disposed of or recycled off-site in accordance with all applicable laws pertaining to the handling and disposal of hazardous waste. However, a potential hazard to the environment and human health remains due to the potential for undocumented hazardous wastes to be encountered during trenching activities.

Under existing conditions, CTF operations include the routine transport to and use of hazardous chemicals at the CTF, including sodium hypochlorite, citric acid, and polymer (see Table 3.8-1). In addition to the continued use of these chemicals at the CTF with implementation of the proposed project, the use of a new chemical, sodium bisulfite would occur at the CTF with project implementation to provide dechlorination of treated effluent prior to discharge to the San Joaquin River. Sodium bisulfite would be injected into the effluent stream and allowed to mix prior to entering the Crossroads Pump Station at the CTF. At the pump station, the effluent would be monitored for compliance with effluent discharge limitations set by the Central Valley RWQCB in the NPDES permit and then discharged or returned to the CTF headworks if not in compliance with discharge limitations.

**Table 3.8-1 Existing and Proposed Chemical Use and Storage Requirements at the Project Site**

| Chemical | Proposed Project Component | Existing Conditions | Proposed Project | |
|---|---|---|---|---|
| | | | 2.5 MGD | 5.2 MGD |
| Sodium Bisulfite, 12.5% solution | Dechlorination of effluent before discharge to the river | NA | 1,000-gallon plastic tank | 2,500-gallon tank and 1,000-gallon tank (total 3,500 gallons of storage) |
| Sodium Hypochlorite | Chlorination and disinfection of effluent water | Two 5,000-gallon tanks, but only one tank is filled at a time | No change from existing conditions | No change from existing conditions |
| Citric Acid | Membrane cleaning | 500 gallons | No change from existing conditions | 750 gallons |
| Polymer | Belt filter press | 250 gallons | No change from existing conditions | 500 gallons |

Note: NA = not applicable

Source: Reed, pers. comm., 2020a

Sodium bisulfite would be transported to the CTF and stored in the existing outside containment area on the site in a 1,000-gallon plastic tank. At buildout, the CTF would treat up to 5.2 mgd, and an additional 2,500-gallon storage tank we be used to store the increased volume of sodium bisulfite in the containment area. The storage of sodium bisulfite for dechlorination would produce some sulfur dioxide off gassing, which would be treated.

Trucks transporting hazardous chemicals to the CTF would use many of the same freeways, arterials, and local streets as other traffic, which creates a risk of accidents and associated release of hazardous materials for other drivers and for people along these routes. Although the transport of hazardous materials could result in accidental spills, leaks, toxic releases, fire, or explosion, the DOT Office of Hazardous Materials Safety prescribes regulations for the safe transportation of hazardous materials, as described in Title 49 of the CFR, that specify packaging and labeling requirements for hazardous materials. The standard accident and hazardous materials recovery training and procedures are enforced by the state and followed by private state-licensed, -certified, and -bonded transportation companies and contractors.

Under existing conditions, potential risks to sensitive receptors (i.e., nearby residents) associated with accidental release of chemicals currently used at the CTF are minimized by implementation of site specific plans for Hazardous Substance Spill Prevention and Response, Emergency Action, Fire Prevention, Chemical Management, Hazardous Material Management, and Hazardous Communication in support of ongoing operation and maintenance. The addition of the use of sodium bisulfite during operations of the proposed project would follow similar operational safety protocols to those that currently exist at the CTF. All site safety plans would remain in effect under the proposed project and would be updated to account for the proposed new facilities and associated hazardous materials use. Adherence to these conditions and requirements for use and storage of hazardous materials would minimize potential for release and/or associated hazards.

As described in Section 1.3, "Tiering from the City of Lathrop Consolidated Treatment Facility Initial Study/Mitigated Negative Declaration and Other EIRs," expansion of the CTF treatment capacity up to 6.0 mgd was previously analyzed at a project level in the *City of Lathrop Consolidated Treatment Facility Project Initial Study/Mitigated Negative Declaration* (2013 CTF IS/MND, City of Lathrop 2013). The 2013 CTF IS/MND considered all impacts related to the construction and operation of the expanded CTF, such as expanding the use of hazardous materials currently used at the CTF (see Table 3.8-1), and determined that the expansion of the CTF would result in a less-than-significant impact related to creating a significant health hazard from the routine transport, use, or disposal of hazardous materials or accidental release into the environment (City of Lathrop 2013:3-53 through 3-55). The 2013 CTF IS/MND also acknowledged that construction associated with the CTF expansion could encounter previously undocumented hazardous waste sites, exposing construction workers, adjacent land uses, and the environment to hazardous waste (City of Lathrop 2013:3-55). The impact was determined to be less than significant with implementation of Mitigation Measure 4.14-1: Existing Hazardous Materials/Waste Sites, from the *Lathrop Water, Wastewater, and Recycled Water Master Plan Environmental Impact Report* (certified in July 2001, SCH No. 1998082050) which requires testing for contamination if any soil discoloration, vapors, or other signs of potential hazardous waste contamination is encountered during construction then removal if found to be contaminated above DTSC-acceptable levels.

Because use, storage, and transport of hazardous materials are subject to local, state, and federal regulations, the intent of which is to minimize risks to human health and the environment; General Plan Safety Policies 3, 4, 5, and 6 support these regulations; comprehensive procedures and plans are in place, would be updated, and would continue to be adhered to, the proposed project would be implemented in compliance with all applicable laws, regulations, and policies and risks to human health and the environment would be minimized during project implementation. Therefore, project construction and operation would not create a significant hazard to the public or the environment through the routine transport use, or disposal of hazardous materials, nor would it create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment. However, because construction activities at the CTF, along the effluent pipeline route, and at the outfall location could still encounter unknown hazardous wastes during excavation that could result in a hazard to construction workers, adjacent land uses, and the environment, this impact would be **potentially significant**.

## Mitigation Measures

### Mitigation Measure 3.8-1: Implement Mitigation Measure 4.14.-1, "Existing Hazardous Materials/Waste Sites," Incorporated by Reference into the 2013 CTF IS/MND

Prior to the development of proposed pipelines/facilities, the City shall have performed a records search of government-recorded hazardous waste sites to identify any proposed pipelines/facilities that bisect recorded hazardous waste sites. In cases where proposed pipelines/facilities intersect recorded hazardous waste sites, or where any soil discoloration, vapors, or other signs of potential contamination exist at the construction sites for these facilities, a qualified consultant shall monitor excavations with an organic vapor analyzer. Soils that exhibit elevated readings, odor, or visual evidence of contamination shall be sampled for laboratory analysis. If the samples are found to be contaminated above Department of Toxic Substances Control (DTSC) acceptable levels, the subject soils at the construction sites for the proposed pipelines/facilities shall be excavated, segregated, treated (if required), and disposed of in accordance with DTSC requirements.

Significance after Mitigation

Implementation of Mitigation Measure 3.8-1 would require that if any soil discoloration, vapors, or other signs of potential hazardous waste contamination is encountered during construction then the soils would be tested and removed if found to be contaminated above DTSC-acceptable levels. This mitigation measure would minimize the risk of an accidental release of hazardous substances that could adversely affect human health or the environment during construction of the proposed project, reducing this impact to a **less-than-significant** level.

## Impact 3.8-2: Impair Implementation of or Physically Interfere with an Adopted Emergency Response Plan or Emergency Evacuation Plan

Construction of the proposed project would result in construction activities within road rights-of-way, which could temporarily limit emergency access or evacuation along these roadways. The proposed underground pipelines, outfall structure, and modifications at the CTF would not represent a physical barrier to the flow of traffic in the City and project operations would not generate traffic in sufficient quantities to result in traffic congestion during an emergency. Because the proposed project would include developing and implementing a traffic control plan per requirements of the City's Encroachment Permit process, potential interference with emergency access or evacuation along roadways in the project site during construction activities would be avoided. This impact would be **less than significant**.

Construction of the proposed project would include excavation within the existing right-of-way along Tesla Way, Harlan Road, and Inland Passage Way. Construction of the proposed pipeline along these roadways could result in the closure of one lane of traffic during construction activities, which could temporarily limit emergency access or evacuation along these roadways.

As described under Section 2.7.3, "Construction Methods and Labor Force," in Chapter 2, "Project Description," the construction contractor would prepare and implement a traffic control plan that would identify measures to continue to provide access to adjacent land uses (e.g., residences, industrial) and maintain emergency access. Preparation of the traffic control plan is required to be submitted to the City with the Encroachment Permit application (City of Lathrop 2020). Such measures could include temporary lane closures and use of signage, traffic cones, and flaggers. During project construction, access to existing land uses would be maintained at all times. Full road closures would not be required. Compliance with Lathrop encroachment permit requirements would avoid potential impacts related to emergency access during construction by maintaining access along project site roadways.

The proposed project would result in new underground pipelines along existing roadways, an outfall structure on the bank of the San Joaquin River, and modifications to the CTF. These improvements would not introduce a physical barrier to the flow of traffic in the City when completed and project operations would not generate traffic in sufficient quantities to result in traffic congestions during an emergency. Therefore, the proposed project would not create a demand for emergency response or require changes to evacuation plans. Furthermore, facility plans would be submitted to the Manteca-Lathrop Fire Protection District for review and approval during development review, and recommendations made by the District with regard to the facility plans would be implemented.

Because the proposed project would maintain emergency access during construction and operations would not create a demand for emergency response or require changes to evaluation plans, this impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

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# 3.9 HYDROLOGY AND WATER QUALITY

This section identifies the regulatory context and policies related to hydrology and water quality, describes the existing hydrologic and water quality conditions at the project site, and evaluates the potential hydrology and receiving water quality impacts of the proposed project on the San Joaquin River and downstream Sacramento–San Joaquin Delta (Delta) waters. The analysis includes a description of existing environmental conditions, the methods used for assessment, thresholds of significance to which assessment findings are compared for the purposes of making impact determinations, and the impacts and any mitigation measures associated with constructing and implementing the proposed project.

## 3.9.1 Regulatory Setting

### FEDERAL

#### Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants to surface waters within the United States. The law authorizes the U.S. Environmental Protection Agency (EPA) to set point-source effluent limits for industry and publicly owned treatment works and requires states (or EPA in the event of default by states) to set water quality standards for contaminants in surface waters. The CWA authorizes EPA to delegate many permitting, administrative, and enforcement aspects of the law to state governments. In such cases, however, EPA still retains oversight responsibilities. Such responsibility has been delegated to the State of California, which administers the CWA through the State Water Resources Control Board (SWRCB) and nine regional water quality control boards (RWQCBs). Relevant sections of the CWA are discussed below.

<u>Section 303(d)</u>

Section 303(d) of the CWA requires states to develop a list of water bodies (or sections of water bodies) that will not attain water quality standards after implementation of minimum required levels of treatment by point-source dischargers (i.e., municipalities and industries). The law requires that states establish priority rankings for waters on the list of impaired water bodies and develop total maximum daily loads (TMDLs) for these waters. A TMDL is the amount of loading that the water body can receive and still meet water quality standards. The TMDL must include an allocation of allowable loadings to point and nonpoint sources, with consideration of background loadings and a margin of safety. Generally, National Pollutant Discharge Elimination System (NPDES) permit limitations for Section 303(d)-listed pollutants must be consistent with the load allocation identified in the TMDL. (The NPDES Permit Program, established under Section 402 of the CWA, is discussed under "Section 402," below.) The CWA Section 303(d) list for California identifies the waterways in the eastern, central, and southern portions of the Delta as impaired for a number of constituents, as shown in Table 3.9-1. The San Joaquin River where the proposed outfall would be located is in the southern portion of the Delta.

<u>Section 401</u>

Section 401 of the CWA requires that applicants for a federal permit or license to conduct any activity that may result in a discharge into navigable waters, including the construction or operation of facilities, must first provide the licensing or permitting agency a certification from the state in which the discharge originates or will originate that the discharge will comply with all applicable water quality standards, limitations, and restrictions. No license or permit may be issued by a federal agency until after Section 401 certification has been granted by the applicable state agency, and no license or permit may be issued if certification has been denied. Examples of permits or licenses that are subject to Section 401 of the CWA include permits issued under Section 404 of the CWA and permits issued under Sections 9 and 10 of the Rivers and Harbors Act. In California, the authority to either grant water quality certification or waive the requirements under Section 401 of the CWA is delegated by SWRCB to the nine RWQCBs. The construction of the CTF outfall in the San Joaquin River for this project will require a CWA 404 permit issued by the U.S. Army Corps of Engineers (USACE) (see the Section 404 discussion, below). Associated with this federal CWA 404 permit, the Central Valley RWQCB would issue the Section 401 water quality certification for this federally authorized outfall construction activity.

**Table 3.9-1 CWA Section 303(d)-Listed Pollutants and Sources for Sacramento–San Joaquin Delta Waterways: Eastern, Central, and Southern Portions**

| Pollutant/Stressor | Listed Source |
|---|---|
| Chlorpyrifos | Source unknown |
| DDT (Dichlorodiphenyltrichloroethane) | Source unknown |
| Diazinon | Source unknown |
| Electrical conductivity [1] | Source unknown |
| Group A pesticides (one or more pesticide compounds, including aldrin, dieldrin, chlordane, endrin, heptachlor, heptachlor epoxide, BHC, endosulfan, and toxaphene) | Source unknown |
| Invasive species | Source unknown |
| Mercury | Agricultural return flows, atmospheric deposition, road and urban runoff, municipal and industrial point sources, natural sources, resource extraction |
| Unknown toxicity | Source unknown |

[1] Electrical conductivity listed as impaired only for the southern Delta.

Source: SWRCB 2017

## Section 402

Section 402 of the CWA established the NPDES Permit Program that regulates point and nonpoint source discharges to waters of the United States. In California, SWRCB and the nine RWQCBs administer the NPDES Permit Program.

The CWA prohibits anyone without an NPDES permit from discharging pollutants from a point source into a water of the United States. Point sources are discrete conveyances, such as pipes or constructed ditches. Pollutants include rock; sand; dirt; and agricultural, industrial, and municipal waste. An NPDES permit contains effluent discharge limitations, prohibitions, receiving water limitations, compliance monitoring and reporting requirements, and other provisions. The proposed project, which involves construction of the CTF discharge to the San Joaquin River, would be subject to an NPDES permit issued by the Central Valley RWQCB.

The NPDES stormwater program requires permits for discharges from construction activities that disturb 1 or more acres. SWRCB adopted a general NPDES permit for stormwater discharges associated with construction activity (Construction General Permit) in Order No. 2009-0009-DWQ, which became effective on July 1, 2010 (as amended by revised Orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit includes specific requirements based on the “risk level” of the site. Three different risk levels are dependent on two factors: (1) project sediment runoff risk and (2) receiving water risk. Obtaining coverage under the Construction General Permit requires filing of a Notice of Intent and preparation and implementation of a stormwater pollution prevention plan (SWPPP), which specifies best management practices (BMPs) to reduce or eliminate sediment and other pollutants in stormwater, as well as non-stormwater discharges. The Construction General Permit requires implementation of BMPs that control pollutant discharges using best available technology economically achievable for toxic contaminants, best conventional technology for conventional contaminants, and any other necessary BMPs to meet water quality standards. The Construction General Permit contains technology-based numeric action levels for pH and turbidity and requires visual monitoring for potential contaminant runoff at all sites and effluent monitoring at all risk level 2 and 3 sites, with follow-up actions required for exceedances of numeric action levels. For Risk level 2 and 3 sites, Rain Event Action Plans also must be prepared and implemented for all storm events forecast to have measurable precipitation. The Construction General Permit also specifies runoff reduction requirements for all sites not covered by a municipal NPDES permit, to minimize post-construction stormwater runoff impacts. The Project requires authorization for coverage under the Construction General Permit.

Section 404

Section 404 of the CWA established a program to regulate the discharge of dredged or fill material into waters of the United States. USACE administers the program and reviews and issues permits. Activities in waters of the United States that are regulated under this program include fill for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry. The basic premise of the program is that no discharge of dredged or fill material may be permitted if (1) a practicable alternative exists that is less damaging to the aquatic environment or (2) the nation's waters would be significantly degraded. In other words, when applying for a permit, the applicant must demonstrate that steps have been taken to avoid impacts on wetlands, streams, and other aquatic resources; that potential impacts have been minimized; and that compensation will be provided for all remaining unavoidable impacts.

### Federal Antidegradation Policy

The federal antidegradation policy is designed to protect existing beneficial uses of surface waters, protect the level of water quality necessary to protect existing uses, and provide protection for higher-quality and national water resources. The federal policy directs states to adopt a statewide policy that includes the following primary provisions (40 Code of Federal Regulations 131.12):

1. Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
2. Where the quality of the waters exceeds levels necessary to support the propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located.
3. Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

### National Toxics Rule and California Toxics Rule

Pursuant to the CWA, EPA promulgated the National Toxics Rule (NTR) criteria to establish numeric criteria for priority toxic pollutants applicable in a number of states, including California. EPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995, and November 9, 1999. On May 18, 2000, EPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria applicable in California. The CTR was amended on February 13, 2001. These rules contain federal water quality criteria for priority pollutants.

## STATE

### Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act is California's statutory authority for the protection of water quality. Under the act, California must adopt water quality policies, plans, and objectives that ensure that beneficial uses of the state are reasonably protected. The act requires the nine RWQCBs to adopt water quality control plans and establish water quality objectives and authorizes SWRCB and RWQCBs to issue and enforce permits containing requirements for the discharge of waste to surface waters and land. The proposed project is located within the jurisdiction of the Central Valley RWQCB.

### Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

The Central Valley RWQCB's *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan) defines the beneficial uses, water quality objectives, implementation programs, and surveillance and monitoring programs for waters of the Sacramento River and San Joaquin River basins (Central Valley RWQCB 2018). The Basin

Plan contains specific numeric water quality objectives for bacteria, dissolved oxygen, pH, pesticides, electrical conductivity (EC), total dissolved solids (TDS), temperature, turbidity, and trace elements, as well as numerous narrative water quality objectives, that are applicable to certain water bodies or portions of water bodies within the basins.

### San Francisco Bay/Sacramento–San Joaquin Delta Water Quality Control Plan

The *Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary* (Bay-Delta Plan) establishes water quality control measures that contribute to the protection of the beneficial uses of the Delta (SWRCB 2018). The Bay-Delta Plan identifies the beneficial uses to be protected, the water quality objectives for reasonable protection of the beneficial uses, and a program of implementation for achieving the water quality objectives for the Delta for the protection of agricultural, municipal, industrial, fish, and wildlife beneficial uses.

### Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California

The Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) sets limits for "thermal waste" and "elevated temperature waste" discharged into coastal and interstate waters and enclosed bays and estuaries of California by establishing water quality temperature objectives. The Thermal Plan also empowers RWQCBs, with SWRCB concurrence, to grant discharger exceptions from the plan's specific water quality objectives, in accordance with Section 316a of the CWA. Estuarine waters are considered to extend from "a bay or the open ocean to the upstream limit of tidal action" (SWRCB 1975). The San Joaquin River at Stockton is subject to tidal action; therefore, the Thermal Plan's temperature objectives for effluent and receiving waters generally apply to discharges within this reach of the river. Within the NPDES permit for the proposed CTF discharge to the San Joaquin River, the Central Valley RWQCB would include effluent and receiving water limitations for temperature that would ensure that the CTF discharge does not cause exceedances of the Thermal Plan temperature objectives in the San Joaquin River.

### Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California

The *Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California* consists of three "parts": Trash Provisions (Part 1), Tribal Subsistence Beneficial Uses and Mercury Provisions (Part 2), and Bacteria Provisions and Variance Policy (Part 3). The plan also includes SWRCB's State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State, adopted in April 2019.

### State Water Resources Control Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California)

The goal of SWRCB Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality of Waters in California") is to maintain high-quality waters where they exist in the state. State Board Resolution No. 68-16 states, in part:

1) Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

2) Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

SWRCB has interpreted Resolution No. 68-16 to incorporate the federal antidegradation policy, which is applicable if a discharge that began after November 28, 1975, will lower existing surface water quality. The Central Valley RWQCB Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. Within the

NPDES permit for the proposed CTF discharge to the San Joaquin River, the Central Valley RWQCB would have to make findings that the discharge would be consistent with the antidegradation policy.

### Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California

The *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California,* referred to as the State Implementation Plan, applies to discharges of toxic pollutants into inland surface waters, enclosed bays, and estuaries (SWRCB 2005). The policy describes methods for determining the need for setting effluent limits in NPDES permits from NTR and CTR criteria and priority pollutant objectives established in RWQCB water quality control plans. The policy also establishes certain monitoring requirements and chronic toxicity control provisions, and includes special provisions for certain types of discharges.

### Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014, enacted on September 16, 2014, provides a framework for the sustainable management of groundwater by local agencies, with an emphasis on the preservation of local control. Local groundwater agencies will develop groundwater sustainability plans to impose reductions in pumping to achieve a sustainable condition in the subbasin and reduce overdraft. The California Department of Water Resources (DWR) has designated the basin underlying the City, the Tracy Subbasin, as medium priority in accordance with the act. Because of its medium-priority designation (i.e., in condition of chronic overdraft and must achieve groundwater sustainability by 2042), the Tracy Subbasin must be managed by a groundwater sustainability plan developed by a local groundwater sustainability agency. The City formed its own groundwater sustainability agency for the portion of its subbasin jurisdiction located east of the San Joaquin River. The portion of the City overlaying the subbasin west of the San Joaquin River is managed by the Stewart Tract Groundwater Sustainability Agency. In total, there are seven groundwater sustainability agencies cooperating to develop a groundwater sustainability plan for the Tracy Subbasin that needs to be completed and approved by January 31, 2022.

### Central Valley Flood Protection Act

The Central Valley Flood Protection Act of 2008 (authorized by Senate Bill 5) directed DWR to prepare the Central Valley Flood Protection Plan (CVFPP). In 2012, the Central Valley Flood Protection Board adopted the first plan, which provided a comprehensive framework for system-wide management and flood risk reduction planning for the Sacramento River and San Joaquin River basins. The CVFPP is updated every 5 years. The CVFPB adopted the 2017 CVFPP Update in August 2017. The Update provides a long-range plan that guides the state’s participation in managing flood risk in the Central Valley and investments in multi-benefit flood projects. The 2022 CVFPP Update is under preparation. The 2022 CVFPP Update is expected to evaluate progress made since passage of major state bonds in 2007 and recommend future management actions led by state, local, and/or federal agencies to continue implementation of the CVFPP with a focus on climate resilience, project implementation, accomplishments, and performance tracking, and alignment with other state efforts.

The act also established the 200-year flood event (i.e., probability of occurring once every 200 years) as the minimum level of flood protection in urban and urbanizing areas in the Sacramento–San Joaquin Valley. Additionally, cities and counties within this region were required to adopt zoning and building code regulations to provide for the 200-year urban level of flood protection. The City adopted changes to its General Plan and municipal code in compliance with the act. Building and zoning code changes apply to all permits issued after July 2, 2016.

## LOCAL

### San Joaquin Area Flood Control Agency

The San Joaquin Area Flood Control Agency is a joint powers authority between the cities of Stockton, Lathrop, and Manteca, San Joaquin County, and the San Joaquin County Flood Control and Water Conservation District for the purpose of addressing flood protection for the member cities and surrounding county area. The San Joaquin Area Flood Control Agency prepared the *Lower San Joaquin River and Delta South Regional Flood Management Plan* in

2014 to provide DWR information on the local visions for flood management for use in future studies. The plan includes identification of flood protection problems and opportunities, potential projects and priorities, and a financial plan.

### City of Lathrop General Plan

The following goal in the City of Lathrop General Plan (City of Lathrop 2004:2-12) is applicable to the proposed project:

**GOAL No. 10: Water Supply, Wastewater and Surface Water Management:** It is a goal of the General Plan to provide for a secure source of fresh water for existing and future residents, and for the reuse of wastewater and surface water so that there is no net increase in water pollution, including point and non-point sources.

### City of Lathrop Integrated Water Resources Master Plan

The Integrated Water Resources Master Plan for the City of Lathrop includes the City's proposed Water System Master Plan (EKI 2019a), Wastewater System Master Plan (EKI 2019b), and Recycled Water System Master Plan (EKI 2019c) and is intended to guide future improvements to these systems. Specifically, the Water System Master Plan identifies water demand unit factors and projections, provides a hydraulic assessment of the City's existing water infrastructure and currently planned improvements, and establishes a list of recommended water system capital improvement projects (CIPs). The Wastewater System Master Plan identifies wastewater flow unit factors and projections, provides hydraulic assessment of the City's existing infrastructure and currently planned conveyances, and establishes a list of recommended wastewater CIPs. The Recycled Water System Master Plan provides an evaluation of recycled water use and disposal alternatives, provides recycled water balance analyses, includes a hydraulic assessment of the City's existing recycled water infrastructure and currently planned improvements, and establishes a list of recommended recycled water system improvements and operational recommendations.

# 3.9.2 Environmental Setting

The receiving water for the proposed CTF effluent discharge is the San Joaquin River. The portion of the San Joaquin River where the proposed outfall is to be located is within the legal boundary of the Delta. The following sections describe the general hydrologic and water quality characteristics of the San Joaquin River and Delta, as well as the underlying groundwater basin.

## HYDROLOGY

### Surface Water Hydrology

The Delta is a freshwater tidal estuary composed of Sacramento River flows from the north, San Joaquin River flows from the south, and flows from numerous other tributaries, including the Mokelumne, Cosumnes, and Calaveras Rivers on the east side and the tidal intrusion of the San Francisco Bay on the west. The Delta is delineated by a legal boundary that extends between the upper extent of tidal effect (near the City of Sacramento on the Sacramento River and Vernalis on the San Joaquin River) and Chipps Island on the west. This area consists of about 500,000 acres of braided waterways, farmland, and levees.

In the area of the proposed project, the San Joaquin River flow is subject to tidal influence. Table 3.9-2 summarizes San Joaquin River flow characteristics, from data collected at DWR's monitoring station at Mossdale Bridge, located approximately 0.7 mile upstream of the proposed outfall location. River flows exhibit a seasonal pattern, with the highest flows occurring in the winter and spring months and the lowest flows occurring in summer. Although river flow rates at this location are affected by tidal inflows (shown with a negative sign in the table below), most of the time, river flow direction is seaward.

The flood management system for the San Joaquin River consists of upstream reservoirs actively operated to maintain space for flood control, levees along the river channel and other major flood control channels, and facilities that pump runoff water and seepage from the levee-protected side of the channels into the flood control channels (San Joaquin Area Flood Control Agency 2014).

**Table 3.9-2 San Joaquin River Flows (in cubic feet per second) at Mossdale Bridge**

| Percentile [1] | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5% | 789 | 828 | 481 | 705 | 122 | -40 [2] | -28 [2] | 7 | 66 | 249 | 723 | 751 |
| 25% | 1,267 | 1,473 | 1,471 | 1,612 | 2,232 | 612 | 159 | 167 | 326 | 931 | 1,132 | 1,195 |
| 50% | 2,078 | 2,370 | 2,301 | 3,012 | 3,333 | 1,314 | 611 | 598 | 813 | 1,823 | 1,372 | 1,619 |
| 75% | 2,912 | 5,068 | 8,507 | 9,741 | 9,801 | 10,516 | 2,553 | 2,818 | 2,525 | 3,017 | 2,096 | 2,150 |
| 90% | 12,152 | 11,568 | 15,967 | 22,988 | 19,874 | 14,539 | 6,064 | 4,702 | 3,940 | 4,125 | 2,565 | 3,914 |
| 95% | 15,670 | 16,597 | 23,102 | 23,978 | 21,570 | 15,653 | 10,473 | 4,940 | 4,415 | 4,799 | 2,991 | 5,426 |

Note: Data Period: October 1, 2005 through April 15, 2020.

[1] Percentile is a measure used to indicate the value below which a given percentage of observations (i.e., data points) falls. For example the 5th percentile flow identified here indicates that only 5% of river flows are less than the 5th percentile flow and 95% of river flows have historically been above the 5th percentile flow.

[2] Negative sign indicates when the location is affected by tidal inflows

Source: DWR 2020

### Groundwater Hydrology

The City of Lathrop and surrounding area are located within the Tracy Subbasin, which lies within the San Joaquin Valley Basin. The Tracy Subbasin is defined by the areal extent of unconsolidated to semiconsolidated sedimentary deposits that are bounded by the Diablo Range on the west, the Mokelumne and San Joaquin Rivers on the north, the San Joaquin River on the east, and the San Joaquin–Stanislaus County line on the south (DWR 2006). The subbasin is drained by the San Joaquin River and one of its major tributaries to the west, Corral Hollow Creek (DWR 2006). The basin has not been designated by DWR as being in a critical overdraft condition.

Several hydrologic formations underlie the Lathrop area. The top two formations—the Victor and Laguna—are used for water supply (EKI 2020). The Victor formation is the uppermost formation and extends from the ground surface to a maximum depth of about 150 feet (EKI 2020). The underlying Laguna formation is hydraulically connected to the Victor formation, and ranges from about 400 feet thick in the Mokelumne River area to about 1,000 feet thick near Stockton. Most of the municipal and industrial wells in the Lathrop area penetrate through the Victor formation to the Laguna formation (EKI 2020). There are some localized depressions underlying Lathrop associated with municipal and industrial well extraction, where elevations in the fall average about 3 feet lower than in spring after winter recharge (EKI 2020).

## WATER QUALITY

### Surface Water Quality

"Water quality" refers to the chemical and physical properties of water that affect the beneficial uses and users of that water. The designated beneficial uses for the San Joaquin River and Delta channels in the project area are defined in the Central Valley RWQCB Basin Plan and Bay-Delta Plan. The beneficial uses are municipal and industrial water supply, agricultural water supply, contact recreation, navigation, warm and cold freshwater habitat, warm and cold migration, warm spawning habitat, and wildlife habitat (Central Valley RWQCB 2018; SWRCB 2018). With the possible exception of navigation, each of these beneficial uses depends, in part, on water quality.

San Joaquin River and Delta water quality supports its beneficial uses most of the time. A number of factors affect river water quality in the project vicinity, including upstream reservoir releases, agricultural return flow quantity and quality, urban stormwater runoff, and municipal wastewater discharges. As identified previously in Table 3.9-1, the portion of the San Joaquin River where the CTF outfall is proposed to be located is on the SWRCB CWA Section 303(d) list. This segment is on the 303(d) list because of impairments from several pesticides that were historically, but are no longer, used in the watershed (i.e., chlorpyrifos, diazinon, DDT, and Group A pesticides), as well as EC, mercury, invasive species, and unknown toxicity. Appendix F includes summary statistics for specific water quality constituents monitored in the San Joaquin River, in the *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*, Appendix A.

### Groundwater Quality

DWR (2006) has characterized some areas within the Tracy Subbasin as having poor water quality. This includes areas of elevated chloride in the vicinity of the City of Tracy and along the San Joaquin River. Elevated areas of nitrate and boron also occur in the vicinity of the City of Tracy.

A portion of the City of Lathrop's water supply is groundwater. Thus, the City routinely monitors the groundwater at its water supply wells for contaminants of concern in drinking water. Based on source water assessments completed by the City, its wells are considered most vulnerable to septic system, airport maintenance, and fuel areas; wastewater treatment plants; and metal plating, finishing, and fabrication facilities. The City's groundwater is treated to remove arsenic. The groundwater quality is such that it meets, with arsenic removal, all drinking water maximum contaminant levels (MCLs) (City of Lathrop 2020).

# 3.9.3 Environmental Impacts and Mitigation Measures

This section describes effects on hydrology and water quality that would result from construction and implementation of the proposed project. Aspects of the project with the potential to affect hydrology and water quality include the activities to construct new facilities and initiation of the new discharge of treated CTF effluent into the San Joaquin River.

## ANALYSIS METHODOLOGY

### Hydrology

The hydrology-related assessments address the effects of the proposed project on groundwater recharge, drainage pattern of the site or area, erosion and siltation, and flooding, including:

- Changes in groundwater recharge related to a change in discharge of effluent to land application areas.
- Changes to the existing drainage pattern of the site or area that would cause erosion or siltation or impede or redirect flood flows due to alteration of the course of a stream or river, or addition of impervious surfaces.
- Exposure of soils and sediments to increased transport related to rainfall runoff on land and flow changes in the San Joaquin River related to the new CTF discharge.
- Flooding risk with the new CTF discharge as related to historical river flows.

### Water Quality

The water quality assessment focuses on changes in receiving water pollutant concentrations. It evaluates both short-term effects related to construction and long-term effects related to operation of the proposed project. The methods used to assess these two types of water quality effects are described below.

#### Construction-Related Water Quality Effects

The assessment of potential construction-related water quality effects considered the work that would be involved and the potential environmental exposure to contaminants. The types of materials and contaminants that may be handled, stored, used, or produced and released to the environment, and the related fate and transport and potential for discharge to adjacent water bodies, were considered. Also considered was the plan for implementing erosion control and stormwater pollution prevention BMPs during and following completion of construction activities.

Operation-Related Water Quality Effects

The assessment of effects on water quality from project operations considered the long-term effects on the water quality of the San Joaquin River and downstream Delta locations that would occur with the new CTF effluent discharge to the river.

The water quality assessment addresses all constituents detected in the CTF effluent. The CTF effluent was monitored for priority pollutants and other constituents of concern to establish a data set to conduct this assessment. Out of the 181 constituents monitored, only 46 constituents were detected above laboratory analytical detection levels. The detected constituents consisted primarily of metals, salinity-related constituents, nitrogen compounds, phosphorus, trihalomethane compounds, and a few pesticides. The results of this monitoring are summarized in Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*, Appendix B. The focus of the assessment in this EIR is on the constituents detected in the effluent. For those constituents not detected in the CTF effluent, project discharges would not have a reasonable potential to cause an exceedance of a water quality criterion/objective associated with those constituents in the San Joaquin River, or to otherwise substantially degrade water quality. Consequently, further assessment of effluent constituents not detected in the CTF effluent above laboratory analytical detection levels is not warranted.

The water quality assessment is based, in part, on numerical modeling of the San Joaquin River using the DWR-developed Delta Simulation Model II (DSM2). EC and temperature were modeled directly by DSM2. Other constituents for which sufficient data exist and that generally behave conservatively when discharged to surface waters were assessed from mass-balance calculations using DSM2-modeled effluent and river fractions, and background river and effluent concentrations. Constituents that undergo transformation upon discharge to the river or that otherwise cannot be mass-balanced (i.e., pH, turbidity, dissolved oxygen) were assessed qualitatively using effluent and river data and knowledge regarding how these constituents may be affected in ambient surface waters. Details of the assessment methodology are provided in Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*, Section 4.1, “Methodology.”

As described in greater detail in Chapter 2, “Project Description,” the City intends to obtain an initial NPDES permit to discharge up to 2.5 million gallons per day (mgd) average dry weather flow (ADWF) of CTF effluent to the San Joaquin River, which is the current ADWF treatment capacity of the CTF. However, the proposed effluent discharge pipeline and outfall would be designed to accommodate CTF flows that would be generated at city buildout. Currently, the projected CTF discharge rate for the buildout level of development that has been approved by the City is 5.2 mgd ADWF. However, if potential additional future development proposed in the City (cumulative development) is ultimately approved by the City Council, the buildout CTF discharge rate would be approximately 6.0 mgd ADWF.

Modeling multiple discharge scenarios is complex and costly. Because cumulative projects in the City were under consideration at the time this analysis was performed, and because this EIR also assesses impacts of the proposed project under the future cumulative condition, the modeling conducted to support the water quality analysis assumed 2.5 and 6.0 mgd ADWF discharge rates. Modeling of a 6.0 mgd discharge includes the 5.2 mgd City General Plan buildout total, so conservatively addresses both that scenario and the potential for additional cumulative development.

## THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, the proposed project would result in a potentially significant impact related to hydrology and water quality if it would:

- violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality, defined as:
  - causing exceedance of applicable state or federal numeric or narrative water quality objectives/criteria or other relevant water quality effects thresholds at a frequency, at a magnitude, or to a geographic extent that would result in adverse effects on one or more beneficial uses within affected water bodies, or
  - degrading water quality at a magnitude, for a duration, or to a geographic extent sufficient to cause a substantial risk of adverse effects on one or more beneficial uses;

- conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan;
- substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would:
  - result in substantial erosion or siltation on- or off-site;
  - substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;
  - 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; or
  - impede or redirect flood flows or increase flood risks; or
- be in a flood hazard, tsunami, or seiche zone, such that it would risk release of pollutants if it were inundated.

## ISSUES NOT DISCUSSED FURTHER

### Surface Runoff

The CTF modifications would be confined to the existing site footprint, and the effluent discharge pipeline would be installed within existing roadways or otherwise below ground, and the modifications would not result in any increase in the extent of impervious surface area or otherwise alter the existing drainage pattern of the site or area. In addition, the proposed project would involve installation of approximately 250 linear feet of new 20-inch welded steel pressurized pipe from the levee toe to the proposed outfall on the waterside of the levee. A new concrete-encased outfall structure also would be constructed below the mean lower low water level and above the channel bed of the San Joaquin River at approximately river mile 55.8 to create a new side-bank outfall. Approximately 100 linear feet (4,500 square feet) of erosion protection material (e.g., articulated concrete block, riprap) would be installed at the outfall site, above and below the headwall, and extending upstream and downstream of the outfall to prevent scour. Therefore, the project would not substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on- or off-site or flooding on- or off-site, or create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. Further, the proposed project would not provide substantial additional sources of polluted runoff. Consequently, the issue of increased surface runoff is not assessed further in this EIR.

### Project Inundation

The only portion of the proposed project that would be within an area subject to flooding is the outfall structure located within the San Joaquin River, which would be submerged approximately 15 feet below the mean lower low water level. Erosion protection material would be placed to protect the outfall structure to prevent scour. There would be no sources of pollutants in a flood hazard area other than the discharge of the CTF effluent, which would be regulated by an NPDES permit to control the discharge of pollutants. Therefore, the proposed project would not release pollutants as a result of project inundation. This issue is not discussed further in this EIR.

### Conflict with Applicable Plans

The proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. The applicable water quality control plans are:

- *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* adopted by the Central Valley RWQCB;
- *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* adopted by SWRCB;

- *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* adopted by SWRCB; and
- *Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California* adopted by SWRCB.

NPDES permits issued by the Central Valley RWQCB to regulate surface water discharges implement the requirements of, and must be consistent with, these plans. Thus, there would be no potential for the proposed project to conflict with or obstruct implementation of an applicable water quality control plan.

The project also would not conflict with or obstruct implementation of a sustainable groundwater management plan because the project would not involve actions that would increase reliance on groundwater or otherwise contribute to groundwater depletion. Effects of the project on groundwater recharge are evaluated in this EIR under Impact 3.9-3, "Result in Impacts on Groundwater during Project Operation."

Therefore, the issue of whether the proposed project would conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan is not discussed further in this EIR.

## IMPACT ANALYSIS

### Impact 3.9-1: Result in Impacts on Water Quality during Project Construction

Project construction activities would have the potential to result in a temporary increase in San Joaquin River total suspended solids (TSS) and turbidity near the construction site and the release of contaminants into the river. Implementation of various permit requirements, including SWRCB Construction General Permit requirements and CWA Section 401 Water Quality Certification requirements, which would be required for project construction, would avoid and minimize potential adverse construction-related effects on surface water quality. Therefore, this impact would be **less than significant**.

Construction-related activities with the potential to affect San Joaquin River water quality include installation of the new outfall, installation and removal of a coffer dam (to facilitate dewatering and creation of a dry work area for construction of the outfall), and discharge of dewatering water from behind the coffer dam. These activities have the potential to result in temporary increases in TSS and turbidity and the discharge of contaminants such as petroleum products, concrete, and trash within the river. Because construction activities would occur over a single season during the dry months, the potential for exposure of construction activities and disturbed soil areas to direct rainfall and stormwater runoff events, and the related risk of increased erosion and off-site runoff of other contaminants, would be low.

#### Effects on Water Quality: Increased Suspended Sediment and Turbidity

Installation and removal of the coffer dam would temporarily disturb river sediments, resulting in temporary elevated TSS and turbidity levels in the river. Also, after the coffer dam is in place and rescue fish seining has been completed (see Mitigation Measures 3.4-2 for details), the coffer dammed area would be dewatered before construction. San Joaquin River water remaining inside the coffer dam would be pumped back over the levee into temporary ponds or tanks on the landside of the levee for settling. Then the supernatant would be discharged to the river, or pumped into the City storm drain system, depending on requirements of the CWA 401 Water Quality Certification. Approximately 10 sheet piles can be placed per day, for a total of approximately 5 days to complete construction of the temporary coffer dam. Its removal is expected to occur over 1 to several days. Installation and removal would be limited to daytime hours. Thus, TSS and turbidity increases associated with coffer dam placement and removal would be of a very short duration (i.e., 5 days). Upland work to install the new pipeline would result in soil disturbances, which also could contribute to river TSS and turbidity increases through transport in rainfall runoff to the river before the disturbed areas are stabilized.

Aquatic life beneficial uses would be most sensitive to elevated TSS and turbidity levels in the river. Chronic increased concentrations of suspended solids and resulting increased turbidity are of concern to fish because at sufficiently high levels, they can cause species to avoid turbid waters. At very high and sustained levels, TSS/turbidity can reduce feeding and growth; displace juveniles; cause physiological stress, respiratory impairment, and gill damage; reduce tolerance to disease and toxicants; reduce survival; and cause direct mortality (Sigler et al. 1984; Stern 1988; Newcombe and Jensen 1996; Bash et al. 2001; Madej et al. 2004). However, Bash et al. (2001) reported that the primary effect of increased turbidity on juvenile salmonids was irritation of the gills and that direct lethality was unlikely.

Based on the general construction window typically imposed by the fish agencies for construction projects within rivers with ESA-listed fishes, the levee crossing and outfall construction is proposed to occur between July 1 and October 31. As such, the only special-status species and life stages that would be present in the river near the outfall during this period would be:

- adult and juvenile green sturgeon
- adult and juvenile white sturgeon;
- adult and juvenile hardhead;
- adult steelhead;
- adult fall-run Chinook salmon;
- juvenile Pacific lamprey; and,
- juvenile Sacramento splittail.

All other special-status species and life stages (including juvenile salmonids) identified in **Error! Reference source not found.** (see Chapter 3.4) would not be present in the river near the outfall during this construction window. Thus, there would be no impact to these special-status fish species/life stages during construction of the proposed project. The remainder of the analysis focuses on the fish species and life stages listed above that would potentially be present in the San Joaquin River in the vicinity of the outfall from July 1 to October 31.

Installation of the coffer dam, and subsequent dewatering of the enclosed construction area, would be expected to create the greatest TSS/turbidity increases in the water column at the site where the sheet piles are driven into the riverbed. A small TSS/turbidity plume would originate at the site and move downstream with the currents. TSS and turbidity levels within the plume would rapidly diminish with increasing distance from the site because the larger suspended sediment particles would resettle to the river bottom and finer suspended material would become rapidly diluted with increasing distance downstream as the plume mixes with river flows. This would result in the highest TSS and turbidity occurring close to the sheet piles, at the outfall construction site, on the east bank. The central and western portions of the river channel immediately adjacent to the outfall construction site and areas immediately upstream of the site would not experience any elevation of turbidity when net flow is moving downstream. At slack tide, the TSS/turbidity plume would temporarily extend out from the construction site in a circular pattern, and resettling of disturbed sediment would happen most rapidly. After net downstream flow returns to the channel, the small, localized elevated TSS/turbidity plume would move in a downstream direction again, along the east bank of the river, with concentrations falling rapidly with increasing distance downstream as a result of both settling and dilution with unaffected river flows. At no time would TSS/turbidity levels be as high as those that occur every winter during and immediately following substantial rain events.

Construction activities would limit the distribution of elevated TSS/turbidity within the river channel. TSS/turbidity would either not increase (e.g., central and west side of channel with net downstream flow) or would temporarily increase to levels that would not be sufficiently high to cause acute adverse effects on aquatic life during daytime construction hours. At night, no coffer dam work would occur; thus, TSS and turbidity levels would return to background levels at the construction site until work activities resumed the following day. This would allow extensive periods of undisrupted passage for migrating and resident fish to move past the site daily in the evenings.

Salmonids may alter their migratory behavior by moving laterally or downstream to avoid turbid areas (Sigler et al. 1984). Larger fish tend to be more tolerant of high concentrations of suspended sediment than smaller fish although migrating adult salmonids may avoid areas with high silt loads (Bjornn and Reiser 1991). Any juvenile salmonids in the area would have the ability to swim to an unaffected portion of the river in response to elevated suspended sediment and turbidity. Thus, temporary daytime increases in suspended sediment and turbidity would not adversely affect juvenile salmonids. If fish did remain in the construction zone, a sufficient portion of the channel (e.g., along the center of the channel, opposite bank, and just upstream) would remain unaffected and would provide suitable migration pathways through the area and rearing habitat within the area.

Little information is available that directly addresses turbidity effects on sturgeon, although the information that is available suggests elevated turbidity may alter the behavior of adults, subadults, and juveniles. In a dredging field study, juvenile and adult Atlantic sturgeon avoided water in the vicinity of a dredged material disposal site (Hatin et al. 2007). However, the TSS/turbidity levels at a dredged material disposal site would be higher than those expected to occur at the CTF outfall construction site. Green sturgeon present in the vicinity of the in-water construction work area may choose to avoid areas of high turbidity. Like salmonids, sturgeon would be expected to swim to an unaffected portion of the river in response to elevated suspended sediment and turbidity and thus would not be adversely affected by temporary daytime increases in suspended sediment and turbidity.

Like salmonids and sturgeon, other fish that could be residing in or moving through the construction area either would not encounter TSS/turbidity levels sufficiently high to affect their movements or may seek to move away from working construction equipment because of underwater noise and elevated turbidity levels.

In short, TSS/turbidity levels in the San Joaquin River at and downstream of the outfall construction site would not reach levels high enough across the entire channel, or last long enough, to cause adverse feeding or growth effects, permanently displace juvenile fishes from the area, cause physiological stress, cause respiratory impairment or gill damage, reduce fish health and thus tolerance to disease and toxicants, reduce survival, or cause direct mortality. Average TSS/turbidity levels across the channel at and downstream of the construction site for the period of time that in-river construction activities would occur are not expected to exceed Basin Plan turbidity objectives. Moreover, TSS/turbidity levels would return to background levels every night (i.e., half of every 24-hour period), and would not reach TSS/turbidity levels as high as those that occur every winter during and immediately following substantial rain events. Finally, the CTF outfall construction activities would occur between July 1 and October 31, when no salmonid juvenile emigration would be occurring in the river.

Additional potential indirect effects of temporarily elevated TSS and turbidity levels in the river include localized displacement of benthic macroinvertebrates resulting from sediment disturbance from sheet piles and sediment re-deposition. These effects would be short lived because of the rapid recolonization rates typically observed for benthic macroinvertebrates communities following temporary riverbed disturbances (Barbour et al. 1999). Moreover, the relative proportion of the San Joaquin River benthic macroinvertebrates community affected within the project site would be negligible.

#### Effects on Water Quality: Contaminants

Potential sources of contaminant discharges would be the discharge of supernatant from dewatering behind the coffer dam and the use of motorized equipment on and around the levee to install the new effluent pipeline and outfall.

The proposed project would require a CWA Section 404 permit, a CWA Section 401 Water Quality Certification, and notification of a California Fish and Game Code Section 1600 Streambed Alteration Agreement before construction of the pipeline and outfall on the waterside of the levee could occur. The construction work also would be subject to authorization under the SWRCB NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ/NPDES Permit No. CAS000002, as amended by 2010-0014-DWQ and 2012-0006-DWQ). Therefore, the City and/or its construction contractor would be required to prepare a SWPPP and implement appropriate construction BMPs for all activities that may result in the discharge of construction-related contaminants from disturbed construction areas. Implementation of appropriate erosion control and pollution prevention BMPs would avoid and minimize construction-related erosion and contaminant discharges. In addition to the BMPs, the SWPPP would include BMP inspection and monitoring activities and would identify the responsibilities of all parties, contingency measures, agency contacts, and training requirements and documentation for those personnel responsible for the installation, inspection, maintenance, and repair of BMPs. The CWA Section 401 Water Quality Certification also would require implementation of measures to prevent, minimize, and contain spills and minimize the amount of soil, sediment, and trash that enters surface waters.

San Joaquin River water inside the coffer dam following installation of the dam would be pumped back over the levee into temporary ponds or Baker tanks on the landside of the levee for settling, and then the supernatant would be discharged to the river or pumped into the City storm drain system depending on water quality requirements. The quality of the discharged supernatant from dewatering would be similar to or equal in quality to that of river water after potential contaminants settled out of the water column. Therefore, the risk is low that contaminants would be discharged into the river via the supernatant.

The use of motorized equipment, and the storage and handling of fuels and equipment lubricants and fluids, may result in petroleum product discharges that could be harmful to water quality if they directly enter the river or spill on the ground and become mobilized in stormwater runoff into surface waters following construction. Other potential construction-related contaminants associated with the equipment and materials used to construct project facilities or would be inadvertently discharged by construction workers may include concrete, trash, cleaners, solvents, and human sanitary wastes. The potential for indirect discharges of these contaminants from dewatered and upland areas during the construction period, or through stormwater runoff following construction, is considered low because construction activities would be conducted during the seasonally dry months of July through October, when runoff is low or nonexistent. Further, implementation of appropriate erosion control and pollution prevention BMPs would avoid and minimize construction-related erosion and contaminant discharges

Aquatic life beneficial uses would be most sensitive to the discharge of contaminants to the San Joaquin River. For example, petroleum products can cause oily films to form on the water surface that can reduce dissolved oxygen levels available to aquatic organisms. The magnitude of effects on aquatic life resulting from accidental contaminant spills would depend on several factors related to the spill, including the proximity to the water body; the type, amount, concentration, and solubility of the contaminant; and the timing and duration of the discharge. The severity of the effect also depends on species and life stage sensitivity, duration of exposure, condition or health of individuals (e.g., nutritional status), and physical or chemical properties of the water (e.g., temperature, dissolved oxygen). Potential effects can range from no effects to mortality of aquatic organisms.

Based on the above, the risk of direct discharges of construction-related contaminants to surface waters would be low. The construction activities occurring in upland areas and in the dewatered portion of the channel would further avoid and minimize potentially adverse construction-related effects because they would be consistent with requirements of the numerous permits described above. The proposed project would not cause constituent discharges at a frequency or magnitude sufficient to result in a substantial increase in exceedances of water quality objectives/criteria relative to existing conditions. The project would not substantially degrade water quality by causing discharges of constituents of concern at a magnitude, for a duration, or to a geographic extent sufficient to cause a substantial risk of adverse effects on one or more beneficial uses in the San Joaquin River or downstream Delta waters. Therefore, this impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-2: Result in Impacts on Flood Flows and Associated Erosion during Project Construction

The placement of the coffer dam for construction of the effluent outfall structure would temporarily reduce San Joaquin River channel capacity. Because the coffer dam would be in place during the summer period of lowest river flows, when large precipitation events do not occur, there would be no effect on flood flows or flood-flow conveyance, and thus no increased channel erosion. This impact would be **less than significant**.

The construction activities that would occur at the CTF plant site and the placement of effluent conveyance pipelines from the CTF to the levee where the outfall structure would be built would not change the drainage pattern of the watershed in these areas.

A temporary coffer dam would be erected within the San Joaquin River channel before any construction on the waterside of the levee would occur. The coffer dam would extend from the ordinary high-water mark into the channel approximately 80 feet, temporarily reducing the channel capacity to convey river flows. The levee crossing and outfall construction would occur between July 1 and October 31, which is the period of lowest river flows. Median river flow rates during this period are less than 2,000 cubic feet per second (cfs), and 95th percentile flow rates are less than 10,500 cfs (Table 3.9-2). By comparison, median river flow rates during higher-flow winter and spring months are 2,000–3,000 cfs, and 95th percentile flow rates are 15,000–24,000 cfs (Table 3.9-2). Thus, the channel has sufficient capacity to convey the lower river flows during the construction period, and the placement of a temporary coffer dam to construct the effluent outfall structure would not impede or redirect flood flows.

The temporary coffer dam would have minor effects on flow patterns within the channel at the outfall construction site, resulting in slightly higher flow velocity through the open, flowing part of the channel. Because the dam placement would occur during the period of lowest river flows, and because the area to be coffer dammed is small compared to the cross-sectional area of the entire channel at this location, the change in velocities and scour in the flowing part of the channel would be minimal, relative to existing conditions, and would not cause substantial increases in channel erosion.

Thus, the proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation on- or off-site, or impede or redirect flood flows. This impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-3: Result in Impacts on Groundwater during Project Operation

With the proposed project, CTF effluent would no longer be discharged to existing land application areas. Because discharge is not a significant source of groundwater recharge for the underlying basin, this impact would be **less than significant**.

The CTF currently discharges effluent to 276 acres of land application areas located in the northern, central, and western portions of Lathrop (Figure 2-2, "Lathrop Recycled Water System Infrastructure"). With the proposed project, effluent would no longer discharge to these areas. Effluent that is applied to the land application areas is done so at rates that do not exceed the agronomic rates for the crops grown. Thus, the effluent historically and currently applied to these land application areas is not applied at a rate that contributes significantly to groundwater recharge. Further, most of the municipal and industrial wells in the Lathrop area withdraw water from the deeper Laguna formation. Consequently, the ceasing of CTF effluent discharges to agricultural land application areas for the project would not affect groundwater. Thus, the proposed project would not decrease groundwater supplies or interfere substantially with groundwater recharge. For these reasons, the project would not impede sustainable groundwater management of the basin, and this impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-4: Result in Hydraulic Impacts That Would Cause Substantial Erosion or Impede or Redirect Flood Flows during Project Operation

The project would install the new outfall structure within the existing profile of the San Joaquin River channel, would occupy less than 1 percent of the cross-sectional area at federal project design flows, and would consist of concrete embedded into the levee and protected with erosion control material. Therefore, the project would not result in substantial erosion or impede flood flows through the channel post-construction, and the hydraulic impacts of the proposed project would be **less than significant**.

The proposed project would result in the installation of a concrete headwall, placement of articulated concrete blocks below the concrete headwall, and placement of riprap above the headwall and against the levee for the new outfall structure within the San Joaquin River. These outfall structure components would be installed within the existing profile of the river channel (Figure 2-7), and the natural contours of the riverbed would be restored to pre-project conditions at the end of construction. The pipe invert at the discharge headwall would be located at an elevation of -12.6 feet (North American Vertical Datum of 1988) near the bottom of the channel and would be submerged at all times. The discharge end of the pipe would include a positive closure device to prevent backflow when the pump station is not operating. Additionally, approximately 100 linear feet of erosion protection material would be placed above and below the outfall headwall, extending upstream and downstream of the outfall, to prevent scour. Based on the proposed outfall design and bathymetric profile of the river channel at the outfall location, the cross-sectional area of the new outfall would be less than 1 percent of the cross-sectional area of the San Joaquin River channel at federal project design flows (Figure 3.9-1).

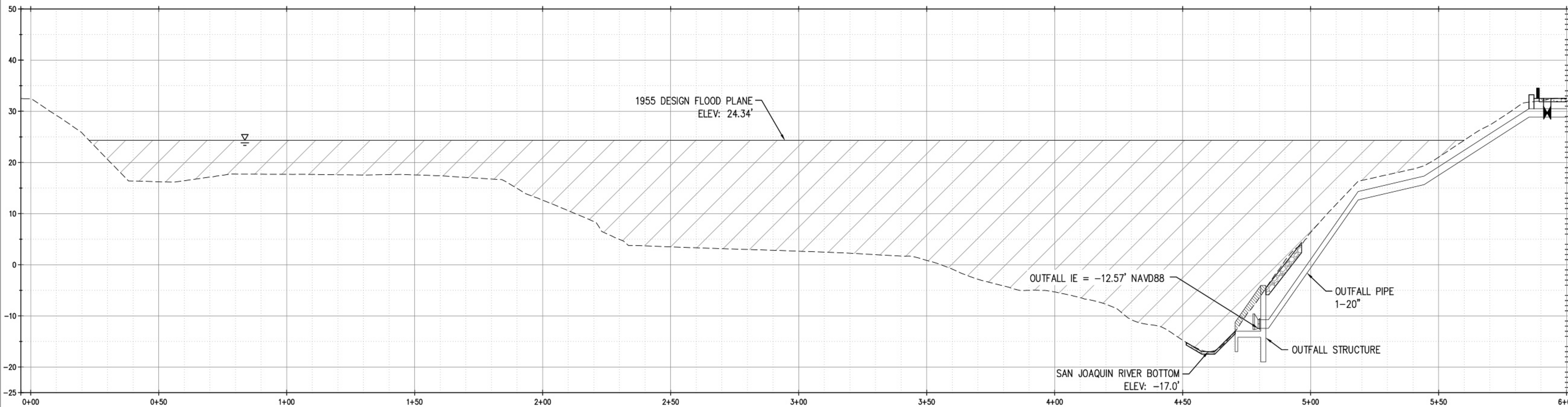
Anticipated initial and future NPDES permit–authorized CTF discharge rates to the San Joaquin River would be 2.5 mgd and up to 6.0 mgd ADWF (general plan buildout plus cumulative). ADWF is defined as the average flow during the three driest months of the year. Therefore, at permitted capacity, discharges would range up to 2.5 mgd (3.9 cfs) in summer and 3.1 mgd (4.8 cfs) in winter under 2.5 mgd ADWF discharge conditions, and under 6.0 mgd ADWF discharge conditions, the monthly average discharge rate would range up to 6.0 mgd (9.3 cfs) in summer and 7.3 mgd (11.3 cfs) in winter. This EIR focuses on permitted discharge capacity. Because of reclamation and recycling by the City, typical summer discharge rates would be substantially lower than the permitted rates cited above. The permitted summer CTF discharge rates would increase median river flow rates by approximately 0.6–1.5 percent. The permitted winter CTF discharge rates would increase median river flow rates by approximately 0.2–0.6 percent and increase the design flow rate by approximately 0.03 percent. These increases in river flow rate would be minimal relative to channel capacity and typical variability in river flow rates.

The outfall structure would be located within the existing profile of the river channel, would occupy less than 1 percent of the cross-sectional area of the channel at federal project design flows, and would consist of concrete protected with erosion control material. Moreover, increases in river flow rate related to the proposed discharge of CTF effluent would be minimal relative to channel capacity and typical flow variability. Consequently, the proposed project would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation on- or off-site, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or off-site, or that would impede or redirect flood flows within the San Joaquin River. Thus, hydraulic impacts of the proposed project would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

| 1955 DESIGN FLOOD PLANE ELEVATION | TOTAL CROSS SECTION AREA | IMPACTED CROSS SECTION AREA | PERCENT OF IMPACT TO 100-YR CROSS SECTION | FEDERAL PROJECT DESIGN FLOOD FLOW, USACE 1955 | MAXIMUM EFFLUENT DISCHARGE RATE | RATIO OF DISCHARGE TO FLOOD FLOW |
|---|---|---|---|---|---|---|
| (24.34') NAVD88 | 9,500 SF | 22 SF | 0.23% | 37,000 CFS | 11.7 CFS (7.55 MGD) | 0.03% |




1 SAN JOAQUIN RIVER CROSS-SECTION

SCALE: HORZ: 1" = 40'
VERT: 1" = 20'

SCALE 1 INCH = 20 FEET
20 0 20 40

SCALE 1 INCH = 10 FEET
10 0 10 20

19010070.05 GRX 009

Source: Image produced and provided by kpff in 2020

Figure 3.9-1 River Cross Section - Lathrop Recycled Water River Discharge Inland Passage Way

## Impact 3.9-5: Result in Impacts on Water Quality during Project Operation: Various Contaminants

The proposed project would result in the discharge of metals, mercury, and potentially other contaminants, such as pesticides and semivolatile organic compounds, to the San Joaquin River. Concentrations of these contaminants in the undiluted CTF discharge would be lower than applicable federal water quality criteria and state water quality objectives, except for barium, which would exceed the Basin Plan objective. However, because barium concentrations would not exceed the Basin Plan objective upon mixing with San Joaquin River water, this impact would be **less than significant**.

Municipal wastewater effluent contains various constituents, including trace metals, mercury and sometimes pesticides, and volatile and semi-volatile organic compounds. If present at sufficiently high concentrations, the discharge of municipal wastewater effluent to surface waters could cause exceedance of federal water quality criteria or state water quality objectives adopted for the water body to protect beneficial uses. Even if constituent concentrations in the discharge are below applicable water quality criteria/objectives, if constituent concentrations are higher than background receiving water concentrations, then the discharge could cause an increase in constituent concentrations within the water body that would result in a lowering of water quality (i.e., degradation). Thus, this assessment addresses both whether project operations would cause exceedance of water quality criteria/objectives for contaminants in the San Joaquin River and downstream Delta waters and whether project operations would cause substantial water quality degradation, such that beneficial uses of these waters may be adversely affected. This assessment is based on data and analyses presented in Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*.

Table 3.9-3 presents the average and maximum concentrations of constituents detected in the CTF effluent, along with applicable water quality criteria/objectives for the San Joaquin River. The CTF produces a high-quality effluent, and most constituents are below water quality criteria/objectives in the undiluted effluent. Constituents exceeding an applicable water quality criterion/objective in the undiluted effluent include barium and 4,4'-Dichlorodiphenyldichloroethane (DDD). Because the CTF effluent concentrations of all other constituents listed in Table 3.9-3 are less than applicable water quality criteria/objectives, project operations (i.e., the discharge of CTF effluent to the San Joaquin River) under both 2.5 and 6.0 mgd ADWF discharge conditions would not cause exceedance of water quality criteria/objectives in the San Joaquin River for these constituents.

**Table 3.9-3 CTF Effluent Quality for Detected Contaminants and Applicable Water Quality Criteria/Objectives**

| Constituent | Units | Average | Maximum | Lowest Applicable Aquatic Life Criterion or Delta-Specific Objective (Basis) | Lowest Applicable Human Health/ Drinking Water Criterion (Basis) |
|---|---|---|---|---|---|
| **Metals** | | | | | |
| Aluminum | µg/L | 39 | 186 | 280 (Basin Plan/EPA AQ) | 200 (Basin Plan/MCL) |
| Antimony | µg/L | 0.73 | 2.34 | -- | 6 (Basin Plan/MCL) |
| Arsenic | µg/L | 6.13 | 8.42 | 150 (CTR AQ) | 10 (Basin Plan/MCL) |
| Barium | µg/L | 148 | 192 | 100 (Basin Plan/Delta) | 1,000 (Basin Plan/MCL) |
| Cadmium | µg/L | 0.036 | 0.178 | 2.4 (CTR AQ) [1] | 5 (Basin Plan/MCL) |
| Chromium (total) | µg/L | 4.52 | 14.5 | 204 (CTR AQ) [1] | 50 (Basin Plan/MCL) |
| Chromium (hexavalent) | µg/L | 0.039 | 0.103 | 11 (CTR AQ) | -- |
| Copper | µg/L | 2.76 | 7.33 | 9.2 (CTR AQ) [1] | 1,000 (Basin Plan/SMCL) |
| Iron | µg/L | 34.2 | 60.2 | 300 (Basin Plan/Delta) | 300 (Basin Plan/MCL) |
| Lead | µg/L | 0.30 | 1.18 | 2.9 (CTR AQ) [1] | 15 (Basin Plan/MCL) |
| Manganese | µg/L | 3.46 | 9.02 | 50 (Basin Plan/Delta) | 50 (Basin Plan/MCL) |
| Molybdenum | µg/L | 8.86 | 36.8 | -- | -- |
| Nickel | µg/L | 1.78 | 2.39 | 51 (CTR AQ) [1] | 100 (Basin Plan/MCL) |

| Constituent | Units | Average | Maximum | Lowest Applicable Aquatic Life Criterion or Delta-Specific Objective (Basis) | Lowest Applicable Human Health/ Drinking Water Criterion (Basis) |
|---|---|---|---|---|---|
| Selenium | µg/L | 0.561 | 0.717 | 5.0 (CTR AQ) | 50 (Basin Plan/MCL) |
| Silver | µg/L | 0.207 | 0.969 | 2.8 (CTR AQ) [1] | 100 (Basin Plan/MCL) |
| Thallium | µg/L | 0.023 | 0.112 | -- | 1.7 (CTR HH) |
| Zinc | µg/L | 53.0 | 93.4 | 118 (CTR AQ) [1] | 5,000 (Basin Plan/MCL) |
| **Mercury** | | | | | |
| Mercury (total) | ng/L | 0.62 | 3.6 | -- | 12 (ISWP-Mercury) |
| Methylmercury | ng/L | 0.0140 | 0.0419 | -- | 0.06 (TMDL) |
| **Other** | | | | | |
| Hardness (as $CaCO_3$) | mg/L | 213 | 275 | -- | -- |
| Boron | µg/L | 0.387 | 0.455 | -- | 750 (Basin Plan/EPA AG) |
| Chloride | mg/L | 211 | 249 | 313 (Basin Plan/Iowa CCC) | 250/500/600 [2] (Basin Plan/SMCL) |
| Fluoride | mg/L | 0.186 | 0.292 | -- | 2 (Basin Plan/MCL) |
| Organic Carbon (dissolved) | mg/L | 4.27 | 6.09 | -- | Narrative (Basin Plan) [3] |
| Organic Carbon (total) | mg/L | 3.24 | 3.70 | -- | Narrative (Basin Plan) [3] |
| Sulfate (as $SO_4$) | mg/L | 79.9 | 110 | -- | 250/500/600 [2] (Basin Plan/SMCL) |
| Sulfite (as $SO_3$) | µg/L | 1.0 | 1.5 | -- | -- |
| **Pesticides** | | | | | |
| 1,2-Dibromo-3-chloropropane | µg/L | 0.005 | 0.009 | -- | 0.2 (Basin Plan/MCL) |
| 2,4-D | µg/L | 0.73 | 1.56 | -- | 70 (Basin Plan/MCL) |
| 4,4'-DDD | ng/L | 1.61 | 4.49 | -- | Nondetect (Basin Plan) [4] |
| **Semivolatile organic compounds** | | | | | |
| Bis(2-ethylhexyl)phthalate | µg/L | 0.420 | 0.609 | -- | 1.8 (CTR HH) |

1 Based on a minimum effluent hardness of 107 mg/L (as $CaCO_3$) and San Joaquin River hardness range of 31.4 to 248 mg/L (as $CaCO_3$).

2 SMCL consists of recommended/upper/short-term ranges.

3 Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. This includes drinking water chemical constituents of concern, such as organic carbon.

4 Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by EPA or the Central Valley RWQCB.

Notes:

µg/L = micrograms per liter.

mg/L = milligrams per liter.

ng/L = nanograms per liter.

-- = no applicable criterion/objective.

Basin Plan = Central Valley RWQCB Water Quality Control Plan for the Sacramento River and San Joaquin River Basins.

Basin Plan/Delta = Basin Plan objective specified for the Delta.

Basin Plan/EPA AQ = criterion recommended in both sources is the same.

CTR AQ = California Toxics Rule criterion for protection of freshwater aquatic life.

CTR HH = California Toxics Rule criterion for human health consumption of water and organisms.

EPA AQ = National Recommended Water Quality Criteria for protection of freshwater aquatic life published by the U.S. Environmental Protection Agency.

Iowa CCC = site-specific criterion developed by the State of Iowa, which represents more recent science than that recommended by EPA.

ISWP-Mercury = SWRCB Inland Surface Waters Plan; Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California, Mercury Water Quality Objectives.

MCL = drinking water maximum contaminant level; incorporated by reference into the Basin Plan as a water quality objective.

SMCL = secondary drinking water maximum contaminant level; incorporated by reference into the Basin Plan as a water quality objective.

TMDL = Central Valley RWQCB total maximum daily load-based numeric target for the Delta.

Source: Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*

The proposed project would result in some water quality degradation in the San Joaquin River for antimony, arsenic, barium, cadmium, chloride, chromium, fluoride, foaming agents, selenium, silver, and zinc under both 2.5 and 6.0 mgd ADWF discharge conditions (Appendix F, Table 10, Table 11, and Table 13). However, the degradation would use less than 10 percent of available assimilative capacity for all of these constituents, except for barium. This means that, except for barium, river water quality would remain below applicable criteria/objectives and hence, would be of a quality that is protective of beneficial uses.

Additional discussion of barium and 4,4'-DDD is provided below.

### Barium

There are two water quality objectives for barium in the Central Valley RWQCB Basin Plan. The first is an objective specifically adopted for Delta water of 100 micrograms per liter (µg/L); the second is the application of the drinking water MCL of 1,000 µg/L incorporated by reference into the Basin Plan's chemical constituents objective. CTF effluent concentrations are greater than the 100 µg/L Delta-specific objective.

The Delta-specific objective of 100 µg/L is expressed as a daily maximum for the dissolved fraction of barium. The basis for this value is unknown, as it does not correspond to other known criteria for the protection of beneficial uses that could be most affected by elevated barium concentrations, which would be consumers of Delta waters (i.e., municipal drinking water uses) or aquatic life through exposure to lethal or sublethal effects. The drinking water MCL is 1,000 µg/L; thus the 100 µg/L objective is not necessary for the protection of municipal drinking water uses. The EPA national recommended water quality criterion for barium addresses only protection of human health and recommends a concentration of 1,000 µg/L for protection of human health, which is the same as the drinking water MCL. There are no known aquatic life thresholds.

Background San Joaquin River barium concentrations average 39 µg/L and are a maximum of 77 µg/L. With the addition of the CTF effluent discharge, the resulting maximum river concentration of barium at the outfall would be a maximum of 81 µg/L under the 2.5 mgd ADWF discharge condition and 88 µg/L under the 6.0 mgd ADWF discharge condition (Appendix F, Table 10). Therefore, the CTF effluent discharge under both the 2.5 and 6.0 mgd ADWF discharge condition would not cause exceedance of the Delta objective of 100 µg/L after initial mixing with river water.

Based on the above considerations, the proposed project would not cause exceedance of applicable water quality criteria/objectives and degradation for barium such that adverse effects on beneficial uses would occur.

### 4,4'-DDD

DDD is a degradation product of DDT, an organochlorine pesticide that was banned for use in the United States in 1972. DDD was also manufactured and used as an insecticide, although to a lesser extent than DDT. DDD is present in the environment in different forms called isomers, and 4,4'-DDD (synonymous with p,p'-DDD) is one type of DDD isomer.

The Central Valley RWQCB Basin Plan objective for pesticides requires total identifiable persistent chlorinated hydrocarbon pesticides not to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by EPA or the Central Valley RWQCB. The CTR contains a 4,4'-DDD human health criterion for protection from the consumption of water and organisms of 0.83 nanograms per liter (ng/L).

4,4'-DDD was detected in one out of four existing CTF effluent samples at an estimated concentration of 4.49 ng/L (Table 3.9-3), less than the laboratory practical quantitation limit of 4.7 ng/L. Its detection in the CTF effluent is suspect given that this pesticide has been banned for decades. Thus, it is unlikely to enter the largely domestic CTF service area collection system. Consequently, the CTF is unlikely to discharge 4,4'-DDD to the San Joaquin River.

Based on the above considerations, the proposed project would not cause exceedances of applicable water quality criteria/objectives or degradation for 4,4'-DDD with a frequency and magnitude that would result in adverse effects on beneficial uses.

In summary, the project discharges at 2.5 mgd and 6.0 mgd ADWF would not cause metals, mercury, pesticides, or semivolatile organic compounds concentrations to exceed applicable state or federal numeric or narrative water quality objectives/criteria anywhere in the San Joaquin River, with the exception of barium. For barium, the Delta objective of 100 µg/L would not be exceeded after initial mixing with river water. The proposed project would result in water quality degradation, but not at a magnitude, for a duration, or to a geographic extent that would cause a substantial risk of adverse effects on one or more beneficial uses. Therefore, this impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-6: Result in Impacts on Water Quality during Project Operation: EC and TDS

The proposed project would result in the discharge of salinity-related constituents that would result in measurable effects on EC and TDS levels in the San Joaquin River near the proposed outfall location. However, the project would not cause EC levels to exceed the Bay-Delta Plan objective for the southern Delta or cause TDS concentrations to exceed the drinking water MCL. Therefore, this impact would be **less than significant**.

EC and TDS are water quality parameters that provide an indication of the salinity of water. The major ionic substances in water—calcium, magnesium, sodium, potassium, bicarbonate, sulfate, and chloride—allow it to conduct an electrical current, which is measured as the EC of the water. TDS is a gravimetric measurement of the total mass of dissolved substances in water.

Salinity increases in Central Valley surface water and groundwater can be attributed to the historical and ongoing activities of urban, rural, industrial, and agricultural water users. Water generally becomes more saline through use because of the addition of salts and evaporative water loss, which concentrates the remaining salts. Domestic, agricultural, and industrial uses of water tend to concentrate salts in waste streams that often go untreated (in terms of salt removal) before they comingle with groundwater and surface waters. The primary source of salinity in the western Delta is seawater intrusion from daily tidal exchange of San Francisco Bay water. Tidal seawater intrusion generally has a greater influence in the Delta in the late summer and fall months, when Delta inflows and outflow are low, and in dry years with lower overall Delta freshwater inflow, resulting in less freshwater to repel the tidal force. San Joaquin River inflow influences salinity levels in the southern and interior Delta. San Joaquin River inflow contains higher levels of salts associated with irrigated agricultural drainage from southern San Joaquin Valley soils of marine origin, which are naturally high in salts, and from Delta water supply operations and export pumping, which can pull higher-salinity water from the interior Delta channels.

Salinity affects consumer acceptance for taste in drinking water supplies and contributes to scale and corrosion in plumbing systems, which affects the useful life of these systems. Increasing salt concentrations in surface water affects agricultural uses in the Delta, forcing use of less salt-sensitive crops or the purchase of higher-quality irrigation water. If the irrigation water is too saline, a problem can occur when salts build up in soils.

SWRCB updated the EC objectives in the Bay Delta Plan in December 2018 for the southern Delta, which includes the reach of the San Joaquin River where the CTF outfall would be located. The prior (2006) Bay-Delta Plan EC objectives for the southern Delta were 700 micromhos per centimeter (µmhos/cm) for April through August and 1,000 µmhos/cm for September through March, expressed as a 30-day running average of mean daily EC. The revised southern Delta EC objective is 1,000 µmhos/cm year-round, also expressed as a 30-day running average of mean daily EC. The EC objective is for protection of the agricultural beneficial use.

The Central Valley RWQCB Basin Plan applies the secondary MCL for TDS as a water quality objective for waters designated municipal and domestic supply, which is a designated beneficial use for the San Joaquin River.

Table 3.9-4 presents the average and maximum EC and TDS levels in the CTF effluent, and the applicable water quality objectives.

**Table 3.9-4 CTF Effluent Quality for EC and TDS, and Applicable Water Quality Objectives**

| Constituent | Units | Average | Maximum | Lowest Applicable Aquatic Life Criterion or Delta-Specific Objective (Basis) | Lowest Applicable Human Health/ Drinking Water Criterion (Basis) |
|---|---|---|---|---|---|
| Electrical conductivity | µmhos/cm | 956 | 1,039 | -- | 1,000 (Bay-Delta Plan) |
| Total dissolved solids | mg/L | 510 | 570 | -- | 500/1,000/1,500 [1] (Basin Plan/SMCL) |

[1] SMCL consists of recommended/upper/short-term ranges.

Notes: µmhos/cm = micromhos per centimeter.

mg/L =milligrams per liter.

Bay-Delta Plan = SWRCB San Francisco Bay/Sacramento-San Joaquin Delta Water Quality Control Plan.

Basin Plan = Central Valley RWQCB Water Quality Control Plan for the Sacramento River and San Joaquin River Basins.

SMCL = Secondary drinking water maximum contaminant level; incorporated by reference into the Basin Plan as a water quality objective.

Source: Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*

The CTF effluent discharge under both 2.5 and 6.0 mgd ADWF discharge conditions would not cause exceedance of the Bay-Delta Plan objective of 1,000 µmhos/cm in the San Joaquin River at the outfall location after initial mixing with river water. Further, the discharge would have little to no effect on river EC at the outfall location in the months of January through May and October through December, when EC increases related to the discharge would be less than 10 µmhos/cm. During the summer months of June, July, August, and September, EC increases would be variable. The 90th percentile EC would increase the greatest, by up to 41 µmhos/cm, but maximum EC levels in the river at the outfall would be well below 1,000 µmhos/cm (Appendix F, Table 8). There would be even less effect of the CTF discharge at southern Delta compliance locations, and the discharge would not cause exceedance of the Bay-Delta Plan EC objective at these locations (Appendix F, Table 9).

The CTF effluent discharge also would have very little effect on TDS concentrations in the San Joaquin River. Average TDS concentrations in the river at the outfall would increase by 2 milligrams per liter (mg/L) to 246 mg/L under the 2.5 mgd ADWF discharge condition and by 4 mg/L to 249 mg/L under the 6.0 mgd ADWF discharge conditions. Thus, the proposed project would not cause exceedance of the Basin Plan objective for TDS.

Based on the above considerations, the project discharges at 2.5 mgd and 6.0 mgd ADWF would not cause exceedances of applicable state water quality objectives for EC and TDS. The proposed project would result in some water quality degradation for EC and TDS, but not at a magnitude, for a duration, or to a geographic extent that would cause a substantial risk of adverse effects on one or more beneficial uses. This impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-7: Result in Impacts on Water Quality during Project Operation: Trihalomethane Compounds

The proposed project would result in the discharge of bromoform, chlorodibromomethane (CDBM), chloroform, and dichlorobromomethane (DCBM) to the San Joaquin River. There are no regulatory criteria for chloroform. Concentrations of bromoform, CDBM, and DCBM in the undiluted CTF discharge would be greater than applicable CTR criteria. However, long-term average concentrations in the San Joaquin River would be less than CTR criteria in areas that could potentially be used for municipal supply, which is the beneficial use of concern for these compounds. Therefore, this impact would be **less than significant**.

Trihalomethane compounds consist of the compounds bromoform, CDBM, chloroform, and DCBM. These compounds are formed during chlorine disinfection of waters containing organic carbon and bromide and are formed within the CTF disinfection process. They are volatile organic compounds, and most of the compound that is formed in water may evaporate into the air when discharged to a riverine aquatic environment that is exposed to turbulent mixing and sunlight. Volatilization from surface waters depends on factors such as vapor pressure of the compound, turbulence, wind, and temperature. In water, these compounds are moderately soluble and do not bioaccumulate in aquatic organisms or higher trophic levels of the food chain. Elevated concentrations of total trihalomethane compounds in drinking water can be harmful to humans when consumed over a lifetime and thus are of primary concern for the municipal water supply beneficial use.

The water quality criteria/objectives for bromoform, CDBM, and DCBM applicable to the San Joaquin River and Delta are the CTR criteria for the protection of human health from consumption of water and organisms. CTF effluent concentrations of CDBM and DCBM are consistently higher than the CDBM and DCBM criteria (Table 3.9-5). Effluent concentrations of bromoform are both higher and lower than the CTR criterion (Table 3.9-5). The CTR criteria for bromoform, CDBM, and DCBM were established based on a 70-year lifetime exposure; thus, long-term average concentrations are the primary concern.

Background San Joaquin River concentrations of bromoform, CDBM, and DCBM are below laboratory detection levels, and these compounds are not present in the river because they are not naturally occurring in the watershed and volatilize to the atmosphere.

**Table 3.9-5 CTF Effluent Quality for Trihalomethane Compounds and Applicable Water Quality Criteria/Objectives**

| Constituent | Units | Average | Maximum | Lowest Applicable Aquatic Life Criterion or Delta-Specific Objective (Basis) | Lowest Applicable Human Health/ Drinking Water Criterion (Basis) |
|---|---|---|---|---|---|
| Bromoform | µg/L | 4.32 | 9.98 | -- | 4.3 (CTR HH) |
| Chlorodibromomethane | µg/L | 34.3 | 43.3 | -- | 0.41 (CTR HH) |
| Chloroform | µg/L | 64.4 | 98.1 | -- | -- |
| Dichlorobromomethane | µg/L | 58.7 | 79.3 | -- | 0.56 (CTR HH) |

Notes: µg/L = micrograms per liter.

-- = no applicable criterion/objective.

CTR HH = California Toxics Rule criterion for human health consumption of water and organisms.

Source: Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*

Long-term average concentrations of bromoform would be 0.07 µg/L under the 2.5 mgd ADWF discharge condition and 0.11 µg/L under the 6.0 mgd ADWF discharge condition (Appendix F, Table 11). Thus, the CTF discharge would not cause bromoform concentrations in the San Joaquin River to exceed the CTR criterion for bromoform, which is 4.3 µg/L, after initial mixing with river water.

Long-term average CDBM and DCBM concentrations would be below CTR criteria under the 2.5 mgd ADWF discharge condition (Appendix F, Table 11). However, the CTF effluent discharge of CDBM and DCBM would cause long-term average concentrations of these compounds to exceed their respective CTR criteria after initial mixing with river water under the 6.0 mgd ADWF discharge condition. Concentrations would remain above CTR criteria until sufficient dilution with downstream waters and volatilization of these compounds occurs. Sufficient dilution and volatilization resulting in concentrations less than the CTR criteria would occur 1 mile downstream of the outfall for CDBM and 8.3 miles downstream of the outfall for DCBM. There are no municipal drinking water intakes within this reach of the San Joaquin River that would be affected by concentrations of CDBM and DCBM being greater than the CTR criteria.

Based on the above considerations, the proposed project would not cause an exceedance of applicable water quality criteria/objectives for bromoform, or chloroform and would not cause exceedances of applicable criteria for CDBM or DCBM outside permitted mixing zones at a frequency, at a magnitude, or to a geographic extent that would result in adverse effects on any beneficial use within affected water bodies. The project would result in water quality degradation for bromoform, CDBM, chloroform, and DCBM, but not at a magnitude, for a duration, or to a geographic extent that would cause a substantial risk of adverse effects on any beneficial use. This impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-8: Impacts on Water Quality from Project Operation: pH

The proposed project would result in discharge to the San Joaquin River of effluent with a pH within the range required by the Basin Plan and thus would not cause the river pH to fall outside of the range required by the Basin Plan. This impact would be **less than significant**.

The Central Valley RWQCB Basin Plan pH objective requires that the San Joaquin River pH be no lower than 6.5 and no greater than 8.5. The CTF effluent pH is routinely within this range (Appendix F, Section 4.5) and would continue to be within this range when discharging to the San Joaquin River under both the 2.5 and 6.0 mgd ADWF discharge condition. Thus, the proposed project would not cause any exceedances of applicable water quality criteria/objectives for pH. Also, the project would not cause degradation for pH at a magnitude, for a duration, or to a geographic extent that would cause a substantial risk of adverse effects on one or more beneficial uses. This impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-9: Result in Impacts on Water Quality during Project Operation: Turbidity

The proposed project would result in discharge to the San Joaquin River of effluent with a turbidity less than the turbidity of the river. Thus, the project would not cause exceedance of the Basin Plan turbidity objective or degradation of water quality for turbidity. This impact would be **less than significant**.

The Central Valley RWQCB Basin Plan turbidity objective limits allowable increases related to a discharge based on background turbidity levels in the receiving water. The CTF produces tertiary-treated effluent characterized by low turbidity levels, typically less than 1 Nephelometric Turbidity Unit (NTU). In contrast, San Joaquin River turbidity levels in the vicinity of the proposed CTF discharge location range from 2 to 62 NTU (Appendix F, Section 4.6). Because the CTF effluent turbidity is less than 1 NTU, the project discharges at 2.5 mgd and 6.0 mgd ADWF would not cause exceedance of applicable water quality criteria/objectives for turbidity. Also, the proposed project would not cause degradation for turbidity. This impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-10: Result in Impacts on Water Quality during Project Operation: Ammonia, Nitrate plus Nitrite, Phosphorus, and Nutrient Biostimulation

The proposed project would result in the discharge of ammonia, nitrate, nitrite, and phosphorus to the San Joaquin River. River concentrations of ammonia with the project would be similar to existing conditions, and the discharge would not cause exceedance of EPA's ammonia criteria for the protection of freshwater aquatic life. River concentrations of nitrite also would be similar to existing conditions and would not exceed the drinking water MCL. River nitrate concentrations would be higher with the proposed project but would not exceed the drinking MCL. River phosphorus concentrations also would be higher with the project. The small increases in nitrate and phosphorus concentrations would not contribute to adverse biostimulatory effects in the Delta. This impact would be **less than significant**.

This discussion addresses the potential impacts of project discharges of ammonia on freshwater aquatic life; nitrate plus nitrite discharges on human health; and the combination of ammonia, nitrate plus nitrite, and phosphorus discharges on nutrient biostimulation in the San Joaquin River and downstream Delta waters.

#### Ammonia and Effects on Freshwater Aquatic Life

Ammonia is a form of nitrogen that can enter surface water bodies and groundwater from sources such as runoff of fertilizers and animal fecal wastes, or as a byproduct of bacterial decay of organic matter above and below the soil surface. Ammonia is a constituent of concern for its potential to have the following effects on the aquatic environment: (1) as a biostimulatory nutrient for primary production (i.e., aquatic algae and plants), (2) as an oxygen-demanding substance when converted to nitrate by nitrifying bacteria, and (3) as a toxic constituent to aquatic organisms. The effects of ammonia discharges on receiving water dissolved oxygen are addressed in Impact 3.9-11.

EPA adopted revised National Recommended Water Quality Criteria for ammonia for the protection of freshwater aquatic life in 2013. The applicable chronic criteria consist of a 4-day criterion and 30-day average criterion and vary depending on whether early life stage protection of fish is necessary. The acute criterion is designed for protection for a 1-hour exposure period and depends on the presence of salmonids. Both criteria depend on the presence/absence of unionid mussels. The criteria for the protection of early life stages, and presence of salmonids and unionid mussels, were used in this assessment based on the aquatic species known to be present in the San Joaquin River at the proposed CTF outfall location. The acute and chronic criteria are based on equations dependent on receiving water pH and temperature.

The CTF produces effluent characterized by ammonia concentrations less than 0.1 milligram per liter as nitrogen (mg/L-N) (Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*, Appendix B). San Joaquin River ammonia concentrations range from <0.01 to 0.5 mg/L-N (Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*, Appendix A). The CTF discharge would not result in measurable changes in San Joaquin River ammonia concentrations, because both the effluent and river have similar concentrations and the discharge would be a small fraction of the river flow (Appendix F, Table 7 and Table 10). Because the San Joaquin River pH and temperature varies daily and seasonally, the applicable ammonia criteria also vary daily and seasonally. Applicable acute and chronic ammonia criteria were calculated from pH and temperature data obtained from DWR's Mossdale Bridge monitoring station, which is about 0.7 mile upstream of the proposed CTF outfall location. The chronic criterion ranged from 0.2 to 3.1 mg/L-N based on the Mossdale Bridge pH and temperature data (Appendix F, Table 10). Thus, the discharge of CTF effluent to the San Joaquin River would not cause exceedance of the EPA ammonia criteria for protection of freshwater aquatic life in the river under both the 2.5 and 6.0 mgd ADWF discharge conditions.

#### Nitrate plus Nitrite and Effects on Human Health

Nitrate and nitrite are inorganic forms of nitrogen that are present in some of the same sources as ammonia (e.g., fertilizers, organic wastes) and are constituents of concern in the aquatic environment as potential biostimulatory nutrients for algae and plants. Nitrate and nitrite are human health constituents of concern in drinking water, particularly for infants and fetuses, where in rare cases high concentrations in drinking water supplies can interfere with oxygen and hemoglobin functions in the blood, causing a condition called methemoglobinemia. Nitrate and nitrite levels can be reduced through the process of denitrification—a bacterial process that produces nitrogen gas that can then diffuse from the water to the atmosphere. Rapid oxidation of nitrite to nitrate results in generally very low nitrite levels under natural river conditions, and the two are often reported as the sum (nitrate plus nitrite).

The Central Valley RWQCB Basin Plan incorporates by reference the drinking water MCLs for nitrate and nitrite as water quality objectives for waters designated for municipal and domestic supply, which includes the San Joaquin River. CTF produces effluent with concentrations of nitrate and nitrite well below the drinking water MCLs (Table 3.9-6). Thus, the discharge of CTF effluent to the San Joaquin River would not cause exceedance of nitrate plus nitrite objectives in the river under both the 2.5 and 6.0 mgd ADWF discharge conditions. Thus, nitrate plus nitrite levels that would occur in the river would be protective of human health associated with the diversion and treatment of river water for drinking water supplies.

**Table 3.9-6 CTF Effluent Quality for Ammonia, Nitrate, Nitrite, and Phosphorus, and Applicable Water Quality Criteria/Objectives**

| Constituent | Units | Average | Maximum | Lowest Applicable Aquatic Life Criterion or Delta-Specific Objective (Basis) | Lowest Applicable Human Health/ Drinking Water Criterion (Basis) |
|---|---|---|---|---|---|
| Ammonia (as nitrogen) | mg/L | 0.05 | 0.20 | 0.2 (Basin Plan/EPA AQ) [1] | Narrative (Basin Plan) [2] |
| Nitrate (as nitrogen) | mg/L | 4.3 | 6.6 | Narrative (Basin Plan) [2] | 10 (Basin Plan/MCL) |
| Nitrite (as nitrogen) | mg/L | 0.002 | 0.014 | Narrative (Basin Plan) [2] | 1 (Basin Plan/MCL) |
| Nitrate plus nitrite (as nitrogen) | mg/L | 4.3 | 6.6 | Narrative (Basin Plan) [2] | 10 (Basin Plan/MCL) |
| Phosphorus, total (as P) | mg/L | 1.43 | 5.4 | Narrative (Basin Plan) [2] | Narrative (Basin Plan) [2] |

[1] The lowest chronic criterion derived from the paired 30-day average pH and temperature measured at DWR's monitoring station at Mossdale Bridge from December 6, 2007, through August 4, 2020.

[2] Water shall not contain biostimulatory substances that promote aquatic growth in concentrations that cause nuisance or adversely affect beneficial uses.

Notes: mg/L = milligrams per liter.

Basin Plan = Central Valley RWQCB Water Quality Control Plan for the Sacramento River and San Joaquin River Basins.

Basin Plan/EPA AQ = criterion recommended in both sources is the same.

MCL = Drinking water maximum contaminant level; incorporated by reference into the Basin Plan as a water quality objective.

EPA AQ = National Recommended Water Quality Criteria for protection of freshwater aquatic life published by the U.S. Environmental Protection Agency.

Source: Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*

#### Ammonia, Nitrate, Nitrite, and Phosphorus as Biostimulatory Substances

Nutrients, primarily nitrogen and phosphorus, play a complex role in water quality and the health of aquatic ecosystems. Although nutrients are necessary for a healthy ecosystem, the overenrichment of nitrogen and phosphorus can lead to a process known as eutrophication. Eutrophication is characterized by development of algae blooms, dense macrophyte growth, oxygen depletion, fish kills, and other water quality issues.

Phosphorus is generally considered a limiting nutrient in freshwater systems, while nitrogen is generally considered a limiting nutrient in marine systems. A limiting nutrient is one that is in shorter supply for organisms that depend on nutrients for growth relative to the other nutrients; thus, increases or decreases in the limiting nutrient affect primary productivity. In freshwater rivers, phosphorus is usually bound to particles, complexing with elements such as iron. When this freshwater enters estuaries and becomes more saline, the phosphorus-iron complex disassociates, and the phosphorus is released in a form that can be readily absorbed by algae. Hence there is, in many instances, adequate phosphorus available for algal growth in estuarine conditions.

Typical signs of eutrophication are often found in the central and southern Delta, where nutrient enrichment feeds algal blooms that can cause areas of oxygen depletion. High nutrient concentrations, warm temperatures, and low flow are conditions shown to be conducive to toxic cyanobacteria with cyanobacteria harmful algae blooms becoming more prevalent in these central and southern Delta regions (Lehman et al. 2008:191, 199). Recent studies have shown that many of these harmful algal blooms are fueled by ammonium, not nitrate (Lehman et al. 2015:165, 2017:94). High nutrient concentrations have also been suggested as facilitating the spread of invasive macrophytes throughout the Delta; however, at this time the exact role of nutrients in driving macrophyte expansion remains unknown (Ta et al. 2017:3).

Unlike most water bodies where nutrients cause too much primary production, the problem affecting beneficial uses in parts of the Delta is too little primary production to support fish populations (Hammock et al. 2019 and references within:705). Despite decades of monitoring and intensive research efforts, the cause for low productivity in certain regions remains unclear (Hammock et al. 2019:705). Several hypotheses to explain the low productivity have been proposed. Jassby recognizes light rather than nutrients as the limiting factor preventing high primary production within the Delta (Jassby et al. 2002:705–708; Jassby 2008:14, 19). Dugdale et al. (2007:17, 27) and Parker et al.

(2012:574, 580–584) offer another hypothesis, that ammonium (a dominant form of nitrogen in the Delta and Suisun Bay) inhibits the uptake of nitrate, which is more conducive to beneficial algae blooms. Glibert et al. (2011:358,398–403) suggest that the current form and ratio of nutrients (i.e., elevated nitrogen, resulting in a high nitrogen-to-phosphorus ratio) in the Delta may give preferential advantage to smaller celled and less nutritious primary producers. Alternatively, other factors contributing to the low primary production may be caused by invasive clams introduced in the mid-1980s that consume algae, reducing food availability for zooplankton and fish (Lucas and Thompson 2012:1,18–20; Kimmerer et al. 1994:81, 89) or reduced phosphorus that becomes a limiting factor for primary production (Van Nieuwenhuyse 2007:1541). Central Valley Project and State Water Project exports may decrease phytoplankton abundance by reducing residence time or transporting the phytoplankton to other areas (Jassby et al. 2002:707).

A recent study by Hammock et al. (2019:703), which used a regression model based on many years of monitoring data, suggests that a combination of two of the hypotheses described above is responsible for the lack of primary production within the Delta: (1) Grazing by invasive clams (i.e., *Potamocurbula ameurensis*) suppresses phytoplankton production, and (2) Central Valley Project and State Water Project exports suppress pelagic productivity through reduction of San Joaquin River residence times by decreasing the volume of freshwater inputs on which residence time acts in both the Sacramento and San Joaquin Rivers. That is, especially during periods of low flow (i.e., summer and fall), overall residence times are decreased because of large-scale water exports upstream of the Delta.

In the San Joaquin River, a pronounced shift occurs in the algal species and loading that enter near Vernalis as the flow travels downstream to the Stockton Deep Water Ship Channel (DWSC), with inflowing diatoms and green algae species decreasing and flagellate species increasing further downstream (Lehman 2007). The turbulent mixing in the river upstream of the DWSC keeps heavy diatom cells suspended in the water column until they reach the DWSC, where the streamflow slows from a riverine to lake-like condition, and the heavy diatom cells settle out. Following on Lehman's work, a 3-year field study by Litton et al. (2008) further attributed algal species shifts and biomass reduction between Vernalis and the DWSC to light limitation related to the increased depth of the nonphotic zone and to an exponential increase in grazing pressure below the head of Old River. Net river flow less than 1,800 cfs was determined to sufficiently reduce residence time in the river and DWSC, thus providing sufficient time for zooplankton communities to flourish and effectively graze on the algae community. Zooplankton grazing alone could reduce chlorophyll *a* concentrations from 20 to 80 percent, depending on the streamflow rate (Litton et al. 2008).

In addition to ammonia, nitrate, and nitrite discussed previously, the CTF discharge to the San Joaquin River would contain phosphorus. Elevated total nitrogen and total phosphorus concentrations are of concern for the potential to stimulate plant and algae growth. Concentrations of ammonia in the CTF discharge would typically be less than 0.1 mg/L-N (Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*, Appendix B), whereas river concentrations range from <0.1 to 0.5 mg/L-N and average 0.15 mg/L-N (Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*, Appendix A). Concentrations of nitrite in the CTF discharge would be less than 0.014 mg/L-N (Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River*, Appendix B), and San Joaquin River nitrite concentrations range from <0.003 to 0.03 mg/L-N and average 0.01 mg/L-N. Because the concentrations of ammonia and nitrite in the proposed discharge would be similar to river concentrations of these constituents, the project discharges at 2.5 mgd and 6.0 mgd ADWF would not cause river ammonia and nitrite concentrations to exceed background conditions.

CTF discharges would result in small increases in river nitrate and phosphorus concentrations because effluent concentrations are greater than river concentrations. The long-term average nitrate concentration in the river would increase from 1.5 mg/L-N under existing conditions to 1.6 mg/L-N under 2.5 mgd ADWF discharge conditions and 1.8 mg/L-N under 6.0 mgd ADWF discharge conditions (Appendix F, Table 11). The long-term average phosphorus concentration in the river would increase from 0.14 mg/L under existing conditions to 0.15 mg/L under 2.5 mgd ADWF discharge conditions and 0.16 mg/L-N under 6.0 mgd ADWF discharge conditions (Appendix F, Table 14).

The higher concentrations of nitrate and phosphorus in the San Joaquin River under the 2.5 and 6.0 mgd ADWF discharge conditions would not contribute to adverse biostimulatory conditions in the river or downstream Delta waters. As described above, algal primary productivity is relatively low in the Delta, and it is generally accepted that algae are not limited by a scarcity of nutrients. Rather, nutrients are in abundance to meet the nutritional requirements of primary producers; thus, small changes in Delta nutrient concentrations related to the proposed project would not substantially affect primary production. The same is true for harmful cyanobacteria algal blooms and macrophyte communities in Delta waters.

Based on the above considerations, the project discharges at 2.5 mgd and 6.0 mgd ADWF would not cause exceedance of applicable water quality criteria/objectives in the San Joaquin River for ammonia, nitrate, or nitrite. Although phosphorus has no adopted numeric criteria or objectives applicable to the San Joaquin River and Delta, the proposed project would not increase receiving water levels at a frequency, at a magnitude, or to a geographic extent that would result in adverse effects on one or more beneficial uses within affected water bodies. The project would result in some water quality degradation for nitrate and phosphorus, but not at a magnitude, for a duration, or to a geographic extent that would cause a substantial risk of adverse effects on one or more beneficial uses. This impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-11: Result in Impacts on Water Quality during Project Operation: Dissolved Oxygen

The proposed project would result in the discharge of oxygen-demanding substances—measured as ammonia and biological oxygen demand (BOD)—to the San Joaquin River. River concentrations of ammonia and BOD with the project would remain similar to existing conditions; thus, the proposed discharge would not decrease dissolved oxygen concentrations in the river below existing conditions or to less than the Basin Plan water quality objective. Therefore, this impact would be **less than significant**.

Dissolved oxygen is a measure of the amount of oxygen dissolved in the water column. Oxygen dissolves into the water column from the atmosphere to achieve equilibrium with the overlying atmosphere. The rate at which oxygen dissolves into the water column of a river is generally a function of water depth and velocity and is driven by the difference between the water column concentration and the dissolved oxygen saturation concentration. The dissolved oxygen saturation concentration is the maximum amount of oxygen that water can contain, and it is largely a function of water temperature for freshwater. Water column dissolved oxygen concentration is also a function of algae and vascular aquatic plant production during daylight hours as a result of photosynthesis, and consumption at night as a result of respiration. Oxidation of carbonaceous and nitrogenous compounds (i.e., decomposition of organic material) by microorganisms (e.g., bacteria, algae) also results in dissolved oxygen consumption. Algae and plant respiration and/or microbial dissolved oxygen consumption at rates greater than the reaeration rate of oxygen from the atmosphere can result in the lowering of water column dissolved oxygen concentrations.

BOD is an analytical parameter that reflects the potential oxygen demand of constituents in water. BOD is generally associated with decay of carbonaceous organic matter and nitrogen-based constituents, such as ammonia. Oxidation of ammonia nitrogen to nitrate in water proportionally requires more oxygen molecules for the conversion compared to carbonaceous BOD, with 1 mg/L of ammonia nitrogen equivalent to about 4.6 mg/L of BOD.

The Basin Plan objective for dissolved oxygen is 5 mg/L for Delta waters, including the portion of the San Joaquin River where the CTF discharge would occur. San Joaquin River concentrations of dissolved oxygen are regularly 7 mg/L or higher, with brief periods (i.e., days) below this level, such as during the summer 2015 drought, when concentrations approached 3 mg/L (Appendix F, Figure 8).

The primary oxygen-demanding substances that would be present in the CTF discharge are ammonia and organic matter, typically measured as biochemical oxygen demand after 5 days ($BOD_5$). The CTF produces effluent with $BOD_5$ concentrations typically less than 2 mg/L, and sometimes as high as 4.3 mg/L. The San Joaquin River $BOD_5$ also is typically less than 2 mg/L but has been measured as high as 5.1 mg/L. With the addition of the CTF effluent discharge, there would be no measurable change in river concentrations of $BOD_5$ (Appendix F, Table 14) and ammonia concentrations also would be similar (Appendix F, Table 10) under both the 2.5 and 6.0 mgd ADWF discharge condition. Because the CTF discharge would not result in measurable increases in San Joaquin River $BOD_5$

or ammonia concentrations, the discharge of these constituents would not cause river dissolved oxygen concentrations to fall below typical concentrations or below the Basin Plan objective of 5 mg/L. Also, as described in Impact 3.9-10, the proposed project would not cause adverse biostimulatory effects, which can contribute to dissolved oxygen depletion.

Based on the above considerations, the project discharges at 2.5 mgd and 6.0 mgd ADWF would not cause exceedances of the applicable Basin Plan water quality objectives for dissolved oxygen. Moreover, the project would not result in any average or long-term degradation of water quality for dissolved oxygen and thus would not cause an increase in risk of adverse effects on aquatic life or other beneficial uses. Thus, this impact would be **less than significant**.

### Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-12: Result in Impacts on Water Quality during Project Operation: Temperature

The proposed project would result in the discharge of effluent that is typically warmer than ambient San Joaquin River temperatures. The project has been designed to not cause exceedance of the Thermal Plan objectives for temperature. Further, based on analysis in Section 3.4, "Aquatic Biological Resources," both the 2.5 and 6.0 mgd ADWF discharge temperature conditions would not cause lethality or any adverse sublethal effects on fishes or their prey organisms. This impact would be **less than significant**.

The following temperature objectives, from the Thermal Plan, apply to the San Joaquin River at the proposed outfall location:

- The maximum temperature shall not exceed the natural receiving water temperature by more than 20°F.
- Elevated temperature waste discharges, either individually or combined with other discharges, shall not create a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, that exceeds 25 percent of the cross-sectional area of a main river channel at any point.
- No discharge shall cause a surface water temperature rise greater than 4°F above the natural temperature of the receiving waters at any time or place.
- Additional limitations shall be imposed when necessary to ensure the protection of beneficial uses.

The concurrent differences between undiluted effluent and river temperatures (henceforth referred to as temperature differentials) have the potential to approach and even exceed 20°F in the late fall and winter months, when San Joaquin River temperatures cool down more rapidly than effluent temperatures in response to cold ambient air temperatures. Maintaining temperature differentials at or below 20°F would be achieved operationally at the CTF by routing effluent through Ponds A, B, and C for cooling before discharge to the river. Effluent and river temperatures would be continuously monitored at the CTF. When the temperature differential approaches 20°F, effluent would be shunted into Pond C, where it would experience cooling because of low ambient air temperatures. Effluent would then flow into and across Pond B and then into and across Pond A, where further cooling would occur before it would be discharged to the river. Additional cooling of the effluent would be expected to occur in the 1.5-mile pipeline between the CTF and the river during the late fall and winter months, when CTF effluent temperature cooling would typically be needed because the ground surrounding the pipeline, and thus the pipeline itself, would be colder than the effluent passing through it. Other wastewater treatment plants in the region that have long pipelines between the facility and the receiving water body demonstrate similar conditions. Thus, with the incorporation of temperature monitoring and effluent cooling in the ponds and pipeline prior to discharge, the proposed project would not cause the maximum effluent temperature to exceed the natural receiving water temperature by more than 20°F under both the 2.5 and 6.0 mgd ADWF discharge conditions.

A thermal plume would occur in the river near the outfall before effluent fully mixed across the river channel. Modeling was conducted to characterize and evaluate the thermal plumes that would occur near the outfall (see

Appendix E, *Aquatic Biological Resources Thermal Effects Assessment for the City of Lathrop Consolidated Treatment Facility Surface Water Discharge Project*, Appendix C, Thermal Plume Graphics).

The thermal plume would have temperatures most different from river background at and near the outfall pipe, and the elevated temperatures within the plume would rapidly attenuate with increasing distance away from the outfall pipe as effluent mixes with river flows. The area of the thermal plume where temperatures would be multiple degrees Fahrenheit above river background temperatures would be small compared to the San Joaquin River cross-section, and the immediate river reach as a whole, under both the 2.5 and 6.0 mgd ADWF discharge conditions.

Under the maximum differential of 20°F, which is the condition under which the greatest thermal gradients would occur within the plume near the outfall pipe, these temperatures would be attenuated to within about 1°F of river background temperatures within about 25 meters or less of the outfall. The thermal plume would be less than 1 meter in diameter at the outfall and spread to about 3 meters in diameter before surfacing (Appendix E, *Aquatic Biological Resources Thermal Effects Assessment for the City of Lathrop Consolidated Treatment Facility Surface Water Discharge Project*, Appendix C). The total river cross-sectional area is about 2,250 square feet at the mean lower low water level (Appendix G, Figure 2), which is 209 square meters. By comparison, the maximum cross-sectional area of the plume that would be greater than 1°F would be no more than about 38 square meters, which is 18 percent of the cross-sectional area. Thus, the proposed project would not cause river temperatures to increase by more than 1°F above natural receiving water temperature in an area exceeding more than 25 percent of the cross-sectional area of the main river channel at any point under both the 2.5 and 6.0 mgd ADWF discharge conditions.

The elevation of the outfall would be positioned such that the discharge would not cause the ambient river surface temperature to increase by more than 4°F. The outfall depth under mean lower low water conditions would be 15.27 feet (Chapter 2, "Project Description," Figure 2-7). Modeling conducted to support identifying the appropriate outfall elevation determined that at this proposed outfall depth, the river surface temperature would not exceed 4°F (Appendix G, *Outfall Design Elevation Technical Memorandum*, Table 2). Thus, the proposed project would not cause a surface water temperature rise greater than 4°F above the natural temperature of the receiving waters at any time or place under both the 2.5 and 6.0 mgd ADWF discharge conditions.

Overall, the CTF discharge would have little effect on San Joaquin River temperature at the outfall location. At the 2.5 mgd ADWF discharge condition, the long-term average river temperature would increase by a maximum of 0.2°F and a maximum of 0.25°F on a daily average basis, which would occur in the winter months (Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River,* Table 15, Appendix B). For the 6.0 mgd ADWF discharge condition, long-term average river temperatures would increase from 0.1 to 0.3°F for all months modeled, and by a 0.25 to 0.6°F on a daily average basis, with the maximum occurring in January (Appendix F, *Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River,* Table 16, Appendix B).

Section 3.4, "Aquatic Biological Resources," and Appendix E in particular, provide a complete analysis of the proposed project's effects on San Joaquin River temperature and associated effects on aquatic biological resources. The analysis concludes that the fully mixed river temperatures and the temperatures within the thermal plume near the outfall under both the 2.5 and 6.0 mgd ADWF discharge conditions would not cause lethality or any adverse sublethal effects on fishes or their prey organisms. Because no adverse thermal effects would occur to individual aquatic organisms, no aquatic species population or community level effects would occur.

Based on the above considerations and analysis presented in Section 3.4, the project discharges at 2.5 mgd and 6.0 mgd ADWF would not cause exceedance of applicable Thermal Plan water quality objectives for temperature. Moreover, the river temperatures that would occur with project discharges at 2.5 mgd and 6.0 mgd ADWF would not cause adverse effects on aquatic life or other beneficial uses within affected water bodies. The proposed project would result in some water quality degradation for temperature, but not at a magnitude, for a duration, or to a geographic extent that would cause a substantial risk of adverse effects on aquatic life or other beneficial uses. For these reasons, this impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.9-13: Result in Impacts on Water Quality during Project Operation: Endocrine-Disrupting Compounds and Constituents of Emerging Concern

The CTF effluent may contain chemical compounds that are classified as unregulated constituents of emerging concern (CECs), including those specific compounds that are considered to be endocrine-disrupting compounds (EDCs). There are no adopted regulatory criteria against which to evaluate CEC concentrations, and effects of CECs are not well understood and are the subject of ongoing research. Therefore, a significance conclusion on the environmental impacts of CEC discharges under the proposed project would be highly speculative and thus cannot be reasonable made based on available information.

CECs are chemical compounds for which the body of scientific knowledge regarding their potential for adverse effects on people or the environment is still developing. Likewise, analytical techniques capable of detecting and quantifying CECs at the low levels at which they occur may have only recently been developed or are being developed. Thus, these compounds are not regulated in surface or drinking waters at this time via federal or state water quality criteria/objectives or policies.

Examples of CECs include, but are not limited to, pharmaceutical and personal care products (PPCPs), natural and synthetic hormones (e.g., 17 beta-estradiol), alkylphenols and alkylphenol ethoxylates, polybrominated diphenyl ether flame-retardant chemicals, per- and poly-fluoroalkyl substances (e.g., perfluorooctanoic acid [PFOA] and perfluorooctane sulfonic acid [PFOS]), phthalates, antimicrobials, and nanoparticles. Anthropogenic sources of CECs include wastewater treatment plants, private septic systems, urban stormwater runoff, industrial effluent, landfill leachates, airport runoff, discharges from fish hatcheries and dairy facilities, runoff from agricultural fields and livestock enclosures, and land amended with biosolids or manure. CECs have a broad range of physical and chemical properties that dictate their fate and transport in the environment.

Among the CECs are contaminants defined by their mode of action referred to as EDCs. These substances mimic or interfere with natural hormones to alter the endocrine system function and, consequently, may cause adverse health effects in an organism or its progeny (World Health Organization 2002). The endocrine system is a complex of glands that secrete hormones and regulate reproduction, growth, and development in vertebrates. Examples of EDCs that may or may not be CECs are specific compounds within the classes of natural plant and animal steroid hormones, PPCPs, trace metals (e.g., arsenic, cadmium, lead, and mercury), dioxins, polycyclic aromatic hydrocarbons, pesticides, and polychlorinated biphenyl compounds (PCBs). Endocrine disruption may be described as a functional change that may lead to adverse effects, not necessarily a toxicological endpoint. EDCs may block, mimic, stimulate, or inhibit the production of natural hormones, disrupting the endocrine system's natural functions. Certain drugs, such as birth control pills, intentionally alter the endocrine system. Those that mimic the female hormone estrogen are referred to as estrogenic, while those that mimic the male hormone androgen are called androgenic. Although some EDCs are known, many chemicals are termed "suspect" because they have not been sufficiently evaluated to allow a conclusive determination of their endocrine-disrupting characteristics.

CECs that are EDCs are human-made synthetic chemicals, such as hormones or other pharmaceuticals that are released into the environment unintentionally and are not removed by conventional wastewater treatment. Properties such as degradation rates, solubility, and partitioning coefficients vary from very low to very high depending on the specific chemical. The U.S. Geological Survey found the occurrence of EDCs or suspect EDCs to be high in surface waters across the country, with 80 percent of the streams sampled containing at least one of the 95 endocrine-disrupting compounds that were tested (Barnes et al. 2002). Although the frequency of occurrence was relatively high in the U.S. Geological Survey study, the measured concentrations of EDCs were low, usually below drinking-water standards for compounds that have such standards (e.g., trace metals, PCBs, organochlorine pesticides). Treatment processes in drinking water treatment plants surveyed by the U.S. Geological Survey and EPA throughout the United States effectively reduced concentrations of many pharmaceuticals, although some CECs persisted to varying degrees (Furlong et al. 2017; Glassmeyer et al. 2017).

Potential ecological effects of EDCs in the aquatic environment were first reported in the 1990s. Studies suggested that the presence of natural and synthetic estrogen hormones in wastewater induced the production in male fish of vitellogenin, which is a protein involved in reproduction that is normally found only in females (Desbrow et al. 1998). Similar results were observed with alkylphenolic compounds, which are breakdown products of industrial surfactants used in products such as paints, herbicides, and cosmetics (Jobling et al. 1998). Overall, the scientific understanding of CECs is not sufficient to definitively predict their fate and transport or potential ecological effects. Moreover, there are no studies available that would indicate there are any existing, or anticipated future, adverse ecological effects associated with any CECs that may be present in the San Joaquin River.

Human exposures and the potential for effects from EDCs at their low concentrations often found in the environment are still largely unknown. The absence of adequate exposure data, especially data regarding exposure during critical development periods, is the weakest link in determining whether any observed adverse effects on humans and/or fish and wildlife are linked to EDCs. A World Health Organization's state-of-the-science assessment concluded that "our current understanding of the effects posed by EDCs to wildlife [including fish] and humans is incomplete" (World Health Organization 2002). Although research has been ongoing, much of the effort has been on testing methodologies, and there is still a great deal of uncertainty as to the long-term effects of low-dose exposure to organisms in the environment. More recent source water CEC concentration data from the nationwide U.S. Geological Survey and EPA survey found that of the 200 chemicals measured, none of the organics exceeded aquatic toxicity benchmarks, although effect data were not available for all of them (Kostich et al. 2017).

At the federal level, most of the effort related to potential regulation of CECs has been via the Safe Drinking Water Act, which directs EPA to publish lists of contaminants not currently subject to any proposed or promulgated national primary drinking water regulations. These Contaminant Candidate Lists support regulation efforts by identifying contaminants known or anticipated to occur in public water systems that may require regulation under the Safe Drinking Water Act. Amendments to the Safe Drinking Water Act in 1996 required EPA to establish criteria for a program to monitor unregulated contaminants and identify no more than 30 contaminants to be monitored every 5 years. CECs and other unregulated contaminants are monitored as part of the Unregulated Contaminant Monitoring Rule. EPA relies on these data describing the occurrence of unregulated contaminants in drinking water and drinking water sources to determine whether to regulate new contaminants.

The EPA approach to developing federal water quality criteria has been to require definitive data and rely on conclusive research before regulatory measures are taken. Similarly, the California Office of Environmental Health Hazard Assessment may establish drinking water advisory levels and fish consumption goals for new chemicals of concern in advance of the development of formal drinking water MCLs by the California Department of Public Health. Among the classes of CECs, both EPA and the State of California are prioritizing efforts to develop water quality criteria for flame retardants and per- and poly-fluorinated compounds. EPA (2016a, 2016b) has promulgated health advisories for PFOA and PFOS. Likewise, SWRCB adopted health-based advisory levels (i.e., notification levels and response levels) for PFOA and PFOS in drinking water based on health recommendations by the California Office of Environmental Health Hazard Assessment (2019). These are nonregulatory, precautionary thresholds for chemicals in drinking water that lack MCLs and inform additional actions as steps are taken to develop MCLs (SWRCB 2020).

Based on the current state of knowledge regarding dose-response relationships of CECs for various organisms and human health effects at the low levels in which they can occur in surface waters, it is likely to be many years before regulatory criteria/objectives are promulgated/adopted or before SWRCB or the Central Valley RWQCB establishes a policy for these compounds in wastewater discharges.

Activated sludge treatment processes are known to be effective in CEC treatment and removal. The Water Environment Research Foundation (WERF) sponsored research that investigated factors of treatment processes that remove PPCPs (Oppenheimer and Stephenson 2006). The WERF study evaluated monitoring data for 20 PPCP compounds in a variety of secondary biological and filtration treatment processes, including processes with nitrification and denitrification. Half of the PPCP target compounds frequently occurred in secondary influent but were also efficiently removed through the treatment process. These compounds included caffeine, ibuprofen, oxybenzone, chloroxylenol, methylparaben, benzyl salicylate, 3-phenylpropionate, butylbenzyl phthalate, and octylmethoxycinnamate. Miège et al. (2009) evaluated PPCP removal performance based on monitoring data from

117 wastewater treatment plants and determined that removal efficiency was highest in facilities using activated sludge with nitrogen removal processes. They determined that the main mechanisms involved in PPCP removal efficiency were biodegradation (e.g., oxidation, hydrolysis, demethylation, cleavage of glucuronide conjugates), sorption on sludge or particulate matter (by hydrophobic or electrostatic interactions), and filtration.

As a result of the effluent discharge that would occur, as permitted by the NPDES permit regulating the CTF discharge, the discharge of any CECs that are present in the effluent may increase San Joaquin River concentrations downstream of the discharge. Resulting in-river concentrations and the change in river concentrations would depend, in part, on ambient concentrations and effluent concentrations, which are unknown. However, it is known that at a 2.5 mgd ADWF discharge rate, the CTF discharge averages 0.2 to 0.8 percent of river flow, which corresponds to an average dilution ratio of 455:1 to 125:1, depending upon the month. Likewise, at 6.0 mgd ADWF, the CTF discharge averages 0.5 to 1.9 percent of river flow, which corresponds to an average dilution ratio of 200:1 to 50:1, depending upon the month. Hence, any CEC present in the CTF effluent would receive substantial dilution in the receiving water.

Because CEC concentration changes in the receiving water cannot be projected, because there are no adopted regulatory criteria against which to evaluate CEC concentrations, and because effects are not well understood and are the subject of ongoing research, a significance conclusion on the environmental impacts of CEC discharges under the proposed project would constitute speculation and thus cannot be made based on available information. Section 15145 of the State CEQA Guidelines provides that if, after a thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact. This is the case for CECs that may be present in the CTF effluent but may or may not be reduced through the current treatment processes. Based on the current state of knowledge, no impact conclusion can be made about CEC concentrations in the CTF effluent, San Joaquin River, and Delta, or any associated effects on beneficial uses in these water bodies.

## Mitigation Measures

No mitigation is required for this impact.

# 3.10 NOISE AND VIBRATION

This section includes background in acoustic fundamentals; a summary of applicable regulations related to noise and vibration; a description of ambient noise conditions in the vicinity of the project site; and an analysis of potential short-term construction and long-term operational impacts associated with the proposed project. Additional data is provided in Appendix F, "Noise Modeling Results."

There were no comments received on the Notice of Preparation related to noise or vibration.

In June 2013, the City adopted the *Consolidated Treatment Facility Project Initial Study/Mitigated Negative Declaration* (2013 CTF IS/MND), which evaluated project-level CEQA authorization for expansion of the CTF treatment capacity to 6 million gallons per day (mgd) and program-level CEQA authorization for an additional 3.1 mgd of treatment capacity, for a total capacity of 9.1 mgd at the CTF. The proposed project and associated operational noise are a covered action within the project description of the 2013 CTF IS/MND. For this reason, the analysis prepared for the 2013 CTF IS/MND is incorporated by reference where appropriate. The proposed project is not located within an airport land use plan, or within two miles of a public airport or public use airport. Additionally, the proposed project is not located within two miles of a private airstrip. Thus, the proposed project would not result in noise impacts related to the exposure of people residing or working in the vicinity of the project site to excessive aircraft-related noise levels, and this issue is not discussed further.

## 3.10.1 Acoustic Fundamentals

Prior to discussing the regulatory and environmental settings for the proposed project, background information about sound, noise, vibration, and common noise descriptors is needed to provide context and a better understanding of the technical terms referenced throughout this section.

### SOUND, NOISE, AND ACOUSTICS

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a human ear. Noise is defined as loud, unexpected, annoying, or unwanted sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

### FREQUENCY

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

### SOUND PRESSURE LEVELS AND DECIBELS

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (μPa). One μPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 μPa. Because of this large range of values, sound is rarely expressed in terms of μPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB).

### Addition of Decibels

Because decibels are logarithmic units, SPLs expressed in dB cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness at the same time, the resulting sound level at a given distance would be 3 dB higher than if only one of the sound sources was producing sound under the same conditions. For example, if one idling truck generates an SPL of 70 dB, two trucks idling simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level approximately 5 dB louder than one source.

### A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within this range better than sounds of the same amplitude with frequencies outside of this range. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies, and then, an "A-weighted" sound level (expressed in units of A-weighted decibels) can be computed based on this information.

The A-weighting system approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgment correlates well with the A-scale sound levels of those sounds. Thus, noise levels are typically reported in terms of A-weighted decibels. All sound levels discussed in this section are expressed in A-weighted decibels. Table 3.10-1 describes typical A-weighted noise levels for various noise sources.

**Table 3.10-1 Typical A-Weighted Noise Levels**

| Common Outdoor Activities | Noise Level (dB) | Common Indoor Activities |
|---|---|---|
| | — 110 — | Rock band |
| Jet fly-over at 1,000 feet | — 100 — | |
| Gas lawn mower at 3 feet | — 90 — | |
| Diesel truck at 50 feet at 50 miles per hour | — 80 — | Food blender at 3 feet, Garbage disposal at 3 feet |
| Noisy urban area, daytime, Gas lawn mower at 100 feet | — 70 — | Vacuum cleaner at 10 feet, Normal speech at 3 feet |
| Commercial area, Heavy traffic at 300 feet | — 60 — | |
| Quiet urban daytime | — 50 — | Large business office, Dishwasher next room |
| Quiet urban nighttime | — 40 — | Theater, large conference room (background) |
| Quiet suburban nighttime | — 30 — | Library, Bedroom at night |
| Quiet rural nighttime | — 20 — | |
| | — 10 — | Broadcast/recording studio |
| Lowest threshold of human hearing | — 0 — | Lowest threshold of human hearing |

Source: Caltrans 2013a:Table 2-5

## HUMAN RESPONSE TO CHANGES IN NOISE LEVELS

As described above, the doubling of sound energy results in a 3-dB increase in the sound level. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different from what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear can discern 1-dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency (1,000–8,000 Hz) range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 Hz and perceives both higher and lower frequency sounds of the same magnitude with less intensity (Caltrans 2013a:2-18). In typical noisy environments, changes in noise of 1–2 dB are generally not perceptible. However, it is widely accepted that people can begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness (Caltrans 2013a:2-10). Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound would generally be perceived as barely detectable.

## GROUND-BORNE VIBRATION

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Ground-borne vibration is vibration of and through the ground. Ground-borne vibration can range from levels that are imperceptible by humans to levels that can create substantial damage to buildings and structures. Ground-borne sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery) or transient in nature (e.g., explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Ground-borne vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV and RMS vibration velocity are normally described in inches per second (in/sec) or in millimeters per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact ground-borne vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2018:110; Caltrans 2013a:6).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to ground-borne vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2018:110, 199; Caltrans 2013b:7). This is based on a reference value of 1 microinch per second.

The typical background ground-borne vibration-velocity level in residential areas is approximately 50 VdB. Ground vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2018:120; Caltrans 2013b:27).

Typical outdoor sources of perceptible ground vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur to fragile buildings. Construction activities can generate sufficient ground vibrations to pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2018:113).

Ground vibration levels generated by construction activity can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations are generated by vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment.

Table 3.10-2 summarizes the general human response to different ground vibration-velocity levels.

**Table 3.10-2 Human Response to Different Levels of Ground Noise and Vibration**

| Vibration-Velocity Level | Human Reaction |
|---|---|
| 65 VdB | Approximate threshold of perception. |
| 75 VdB | Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable. |
| 85 VdB | Vibration acceptable only if there are an infrequent number of events per day. |

Notes: VdB = vibration decibels referenced to 1 microinch/second and based on the root mean square (RMS) velocity amplitude

Source: FTA 2018:120

## COMMON NOISE DESCRIPTORS

Noise in our daily environment fluctuates over time. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors used throughout this section.

**Equivalent Continuous Sound Level ($L_{eq}$):** $L_{eq}$ represents an average of the sound energy occurring over a specified period. In effect, $L_{eq}$ is the steady-state sound level containing the same acoustical energy as the time-varying sound level that occurs during the same period (Caltrans 2013a:2-48). For instance, the 1-hour equivalent sound level, also referred to as the hourly $L_{eq}$, is the energy average of sound levels occurring during a 1-hour period and is the basis for noise abatement criteria used by California Department of Transportation (Caltrans) and Federal Transit Administration (FTA) (Caltrans 2013a:2-47; FTA 2018:210).

**Maximum Sound Level ($L_{max}$):** $L_{max}$ is the highest instantaneous sound level measured during a specified period (Caltrans 2013a:2-48; FTA 2018:207–208).

## SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The manner in which a noise level decreases with distance depends on geometric spreading, ground absorption, atmospheric effects, and shielding by natural or human-made features, described in detail below.:

### Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Roads and highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources, thus propagating at a slower rate in comparison to a point source. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.

### Ground Absorption

The propagation path of noise from a source to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave–canceling provides additional attenuation associated with geometric spreading. Traditionally, this additional attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an additional ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the attenuate rate associated with cylindrical spreading, the additional ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance. This would hold true for point sources, resulting in an overall drop-off rate of up to 7.5 dB per doubling of distance.

### Atmospheric Effects

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels, as wind can carry sound. Other factors such as air temperature, humidity, and turbulence can also affect sound attenuation.

### Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver attenuates noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction (Caltrans 2013a:2-41; FTA 2018:42). Barriers higher than the line of sight provide increased noise reduction (FTA 2018:16). Vegetation between the source and receiver is rarely effective in reducing noise because it does not create a solid barrier unless there are multiple rows of vegetation of sufficient height (FTA 2018:15, 104, 106).

# 3.10.2 Regulatory Setting

## FEDERAL

### U.S. Environmental Protection Agency Office of Noise Abatement and Control

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate Federal noise control activities. In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to state and local governments. However, documents and research completed by the EPA Office of Noise Abatement and Control continue to provide value in the analysis of noise effects.

### Federal Transit Administration Standards for Exposure to Ground Vibration

To address the human response to ground vibration, FTA has set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines are presented in Table 3.10-3.

**Table 3.10-3 Ground-Borne Vibration Impact Criteria for General Assessment of Human Response**

| Land Use Category | Ground-Borne Vibration Impact Levels for Human Response (VdB re 1 microinch/second) Frequent Events[1] | Ground-Borne Vibration Impact Levels for Human Response (VdB re 1 microinch/second) Occasional Events[2] | Ground-Borne Vibration Impact Levels for Human Response (VdB re 1 microinch/second) Infrequent Events[3] |
|---|---|---|---|
| *Category 1:* Buildings where vibration would interfere with interior operations. | 65[4] | 65[4] | 65[4] |
| *Category 2:* Residences and buildings where people normally sleep. | 72 | 75 | 80 |
| *Category 3:* Institutional land uses with primarily daytime uses. | 75 | 78 | 83 |

1 "Frequent Events" is defined as more than 70 vibration events of the same source per day.

2 "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.

3 "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.

4 This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define acceptable vibration levels.

Notes: VdB re 1 microinch/second = vibration decibels referenced to 1 microinch/second and based on the RMS velocity amplitude

Source: FTA 2018:123–126

# STATE

## California Department of Transportation Standards for Exposure to Ground Vibration

In 2013, Caltrans published the Transportation and Construction Vibration Manual (Caltrans 2013b). The manual provides general guidance on vibration issues associated with construction and operation of projects in relation to human perception and structural damage. Table 3.10-4 presents recommendations for levels of vibration that could result in damage to structures exposed to continuous vibration.

**Table 3.10-4 Caltrans Recommendations Regarding Levels of Vibration Exposure**

| PPV (in/sec) | Effect on Buildings |
|---|---|
| 0.4–0.6 | Architectural damage and possible minor structural damage |
| 0.2 | Risk of architectural damage to normal dwelling houses |
| 0.1 | Virtually no risk of architectural damage to normal buildings |
| 0.08 | Recommended upper limit of vibration to which ruins and ancient monuments should be subjected |
| 0.006–0.019 | Vibration unlikely to cause damage of any type |

Notes: PPV = Peak Particle Velocity; in/sec = inches per second

Source: Caltrans 2013b

# LOCAL

## City of Lathrop General Plan

Part VI Section B of the City of Lathrop General Plan (City of Lathrop 2004) includes the following noise policies that are relevant to the proposed project:

- **Policy 1.** Areas within the City shall be designated as noise-impacted if exposed to existing or projected future noise levels exterior to buildings exceeding 60 dB CNEL or the performance standards prescribed in Table VI-1 (shown as Table 3.10-5 and Table 3.10-6 in this EIR).

**Table 3.10-5 Exterior Noise Level Standards**

| Receiving Land Use | Nighttime (10 p.m. to 7 a.m.) Noise Level (dB)[1,2] Rural Suburban | Nighttime (10 p.m. to 7 a.m.) Noise Level (dB)[1,2] Suburban | Nighttime (10 p.m. to 7 a.m.) Noise Level (dB)[1,2] Urban | Daytime (7 a.m. to 10 p.m.) Noise Level (dB)[1,2] Rural Suburban | Daytime (7 a.m. to 10 p.m.) Noise Level (dB)[1,2] Suburban | Daytime (7 a.m. to 10 p.m.) Noise Level (dB)[1,2] Urban |
|---|---|---|---|---|---|---|
| One and Two Family Residential | 40 | 45 | 50 | 50 | 55 | 60 |
| Multiple Family Residential | 45 | 50 | 55 | 50 | 55 | 60 |
| Public Space | 50 | 55 | 60 | 50 | 55 | 60 |
| Limited Commercial | — | 55 | — | — | 60 | — |
| Commercial | — | 60 | — | — | 65 | — |
| Light industrial | — | 70 | — | — | 70 | — |
| Heavy Industrial | — | 75 | — | — | 75 | — |

1 Each of the noise level standards specified in Table 3.10-5 shall be reduced by 5 dB for pure tone noises, noise consisting primarily of speech or music, or for recurring impulsive noises. The standards should be applied at residential or other noise sensitive land use and not on the property of a noise-generating land use.

2 For purposes of the analysis in this EIR, it is assumed that the noise standards listed in Table 3.10-5 are $L_{eq}$ standards rather than community noise equivalent level (CNEL)/$L_{dn}$ standards because separate daytime and nighttime noise level standards are provided. CNEL and $L_{dn}$ represent noise levels over a 24-hour period and, thus, would include both daytime and nighttime noise levels.

Note: dB = decibel

Source: City of Lathrop 2004:6-10

**Table 3.10-6 Durational Noise Level Standards**

| Nighttime (10 p.m. to 7 a.m.) Noise Level (dB)[1] | Noise Category | Cumulative Number of Minutes in Any 1-Hour Period | Daytime (7 a.m. to 10 p.m.) Noise Level (dB)[1] |
|---|---|---|---|
| 45 | 1 | 30 | 55 |
| 50 | 2 | 15 | 60 |
| 55 | 3 | 5 | 65 |
| 60 | 4 | 1 | 70 |
| 65[2] | 5 | 0 | 75[2] |

[1] Each of the noise level standards specified in Table 3.10-4 shall be reduced by 5 dB for pure tone noises, noise consisting primarily of speech or music, or for recurring impulsive noises. The standards should be applied at residential or other noise sensitive land use and not on the property of a noise-generating land use. Nighttime and daytime standards are measured by dB.

[2] Because noise levels of 75 dB during daytime hours and 65 dB during nighttime hours are prohibited for any amount of time, these noise levels are used as $L_{max}$ standards in this EIR.

Notes: dB = decibel

Source: City of Lathrop 2004:6-10

- **Policy 3.** New development of industrial, commercial or other noise generating land uses will not be permitted if resulting noise levels will exceed 60 dB CNEL in areas containing residential or other noise-sensitive land uses. Additionally, new noise generating land uses which are not preempted from local noise regulation by the State of California will not be permitted if resulting noise levels will exceed the performance standards contained in [Table 3.10-5 and Table 3.10-6] in areas containing residential or other noise-sensitive land uses.
- **Policy 4.** Noise level criteria applied to land uses other than residential or other noise-sensitive uses shall be consistent with the recommendations of the California Office of Noise Control.

## City of Lathrop Municipal Code

Chapter 8.20 of the Lathrop Municipal Code (City of Lathrop 2020) includes the following noise policies that are relevant to the proposed project:

- **Section 8.20.040. Ambient base noise level.** Where ambient noise level is less than designated in this section the respective noise level in this section shall govern (Table 3.10-7).

**Table 3.10-7 Community Environment Classification**

| Zone | Time | Very Quiet (rural, suburban) Sound Level (dB) | Slightly Quiet (suburban, rural) Sound Level (dB) | Noisy (urban) Sound Level (dB) |
|---|---|---|---|---|
| R1 and R2 | 10 pm to 7 am | 40 | 45 | 50 |
| | 7 pm to 10 pm | 45 | 50 | 55 |
| | 7 am to 7 pm | 50 | 55 | 60 |
| R3 and R4 | 10 pm to 7 am | 45 | 50 | 55 |
| | 7 am to 10 pm | 50 | 55 | 60 |
| Commercial | 10 pm to 7 am | 50 | 55 | 60 |
| | 7 am to 10 pm | 55 | 60 | 65 |
| M1 | Anytime | 70 | 70 | 70 |
| M2 | Anytime | 75 | 75 | 75 |

Notes: dB = decibel, R1 through R4 = one-family residential, M1 = Limited Industrial, M2 = General Industrial

Source: City of Lathrop 2017, 2020

- **Section 8.20.100. Machinery, equipment, fans, and air conditioning.** It shall be unlawful for any person to operate any machinery, equipment, pump, fan, air conditioning apparatus, or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property line of any property to exceed the ambient base noise level by more than five decibels.
- **Section 8.20.110. Construction of buildings and projects.** It shall be unlawful for any person within a residential zone or within a radius of five hundred (500) feet therefrom, to operate equipment or perform any outside construction or repair work on buildings, structures or projects or to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction type device between the hours of ten p.m. of one day and seven a.m. of the next day, or eleven p.m. and nine a.m. Fridays, Saturdays and legal holidays, in such a manner that a reasonable person of normal sensitiveness residing in the area is caused discomfort or annoyance unless beforehand a permit therefore has been duly obtained from the office or body of the City having the function to issue permits of this kind. No permit shall be required to perform emergency work as defined in Sections 8.20.010 through 8.20.040.
- **Section 8.20.020.** "Emergency work" means work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from an imminent exposure to danger or work by private or public utilities when restoring utility service.
- **Section 8.20.190. General noise regulations.**

  A. Notwithstanding any other provision of this chapter, and in addition thereto, it shall be unlawful for any person to willfully make or continue, or cause to be made or continued, any loud, unnecessary or unusual noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

  B. The standards which shall be considered in determining whether a violation of the provisions of this sections exists shall include, but not be limited to, the following:

     1. The level of the noise;
     2. The intensity of the noise;
     3. Whether the nature of the noise is usual or unusual;
     4. Whether the origin of the noise is natural or unnatural;
     5. The level and intensity of background noise, if any;
     6. The proximity of the noise to residential sleeping facilities;
     7. The nature and zoning of the area within which the noise emanates;
     8. The density of the inhabitation of the area within which the noise emanates;
     9. The time of the day or night the noise occurs;
     10. The duration of the noise;
     11. Whether the noise is recurrent, intermittent, or constant; and
     12. Whether the noise is produced by a commercial or noncommercial activity.

# 3.10.3 Environmental Setting

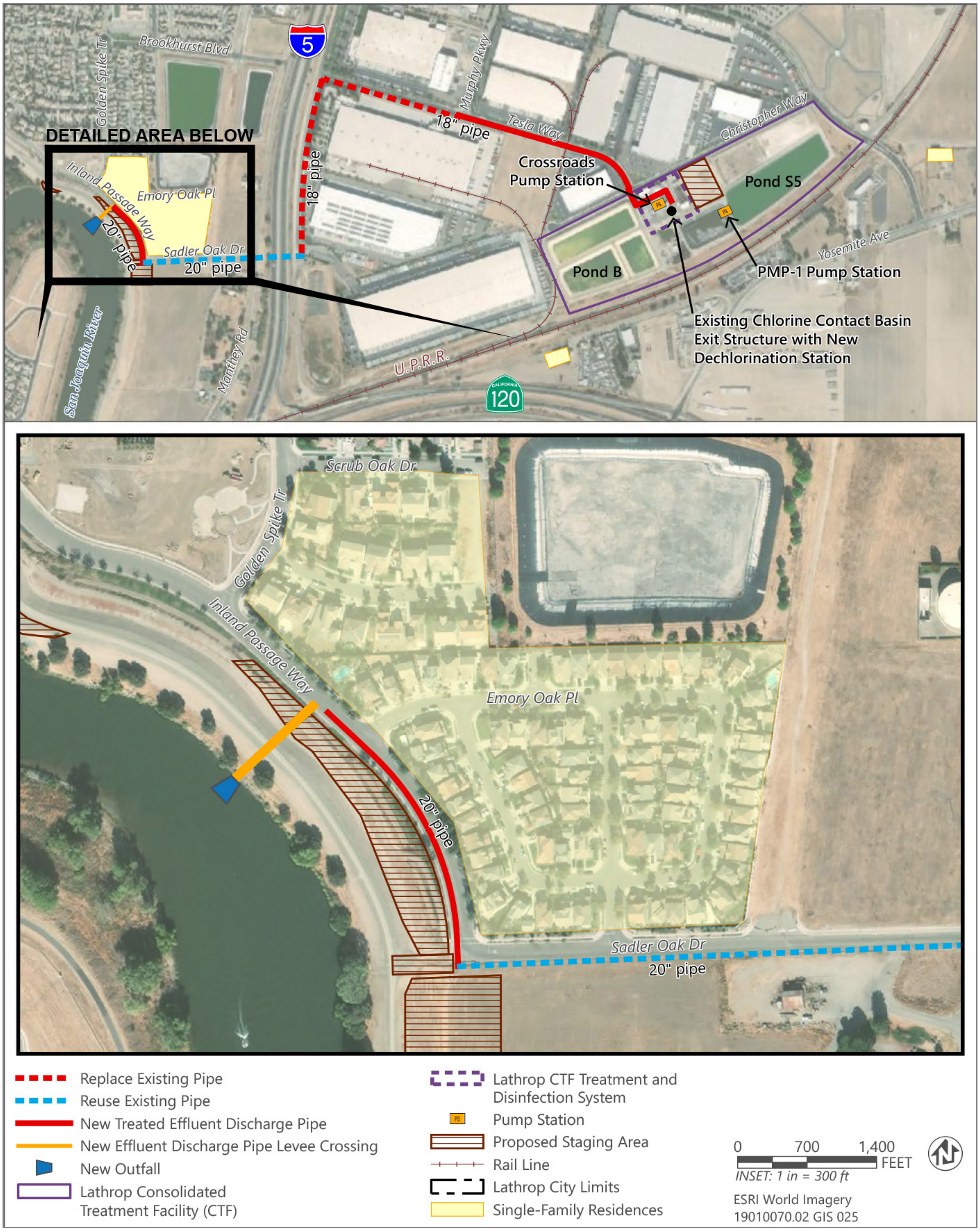
## EXISTING NOISE- AND VIBRATION-SENSITIVE LAND USES

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels, and because of the potential for nighttime noise to result in sleep disruption. Additional land uses such as schools, transient lodging, historic sites, cemeteries, and places of worship are also generally considered sensitive to increases in noise levels. These land use types are also considered vibration-sensitive land uses in addition to commercial and industrial buildings where vibration would interfere with operations within the building.

No noise-sensitive receptors were identified in the vicinity of the CTF, which is surrounded by industrial and commercial land uses. The suburban single-family homes along the north side of Sadler Oak Drive and east side of Inland Passage Way are located approximately 60 feet from the closest edge of the proposed effluent discharge pipeline. Additionally, the suburban single-family homes along Inland Passage Way directly north of the intersection of Emory Oak Place and Inland Passage Way are located approximately 90 feet from the closest edge of the proposed pipe levee crossing and approximately 295 feet from the bank of the San Joaquin river, where the new outfall would be constructed. Figure 3.10-1 shows the location of these residences relative to the project site.

## EXISTING NOISE SOURCES

The existing noise environment is predominantly defined by traffic on the existing roadway network, including I-5 and SR 120. Using traffic volume data obtained by Caltrans, it was calculated that I-5 generates noise levels of 80 CNEL at 50 feet from the edge of the roadway (Caltrans 2017). The operation of the Southern Pacific and Union Pacific railroad also generates noise in the area, though this noise is more periodic in nature. The industrial and commercial land uses surrounding the CTF may generate localized noise from sources such as stationary mechanical equipment or loading dock activity. The residential community located next to the proposed effluent discharge pipeline and outfall structure is bordered by the San Joaquin River to the west and agricultural land to the south. Such land uses do not typically generate high noise levels.




Source: adapted by Ascent Environmental in 2020

Figure 3.10-1 Residential Receptors Near the Proposed Project

# 3.10.4 Environmental Impacts and Mitigation Measures

## ANALYSIS METHODOLOGY

### Construction Noise and Vibration

To assess potential short-term, construction-related noise and vibration impacts, sensitive receptors and their relative exposure were identified. Proposed project-generated construction noise and vibration levels were determined based on methodologies, reference emission levels, and usage factors from FTA's *Guide on Transit Noise and Vibration Impact Assessment* methodology (FTA 2018) and FHWA's *Roadway Construction Noise Model User's Guide* (FHWA 2006). Reference levels for noise and vibration emissions for specific equipment or activity types are well documented and the usage thereof is common practice in the field of acoustics.

## THRESHOLDS OF SIGNIFICANCE

The significance determinations in this noise impact analysis are based on Appendix G of the State CEQA Guidelines and the noise standards established by the City. An impact related to noise would be considered significant if implementation of the proposed project would:

- generate a substantial temporary increase in noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Based on the standards established in the City of Lathrop General Plan and Municipal Code, temporary construction noise impacts would be considered significant if project construction would:
  - expose suburban single-family residences to noise levels that exceed 45 dB $L_{eq}$ or 65 dB $L_{max}$ during nighttime hours (10 p.m. to 7 a.m.), as shown in Table 3.10-5 and Table 3.10-6; or occur within 500 feet of a residential zone during the hours prohibited by Section 8.20.110 of the Municipal Code, these hours being between 10 p.m. and 7 a.m. Sunday through Thursday and 11 p.m. and 9 a.m. on Fridays, Saturdays, and legal holidays;
- generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Based on the standards established in the City of Lathrop General Plan and Municipal Code, permanent operational noise impacts would be considered significant if project construction would:
  - expose rural suburban single-family residences to noise levels that exceed 50 dB $L_{eq}$ or 75 dB $L_{max}$ during daytime hours (7 a.m. to 10 p.m.) or exceed 40 dB $L_{eq}$ or 65 dB $L_{max}$ during nighttime hours (10 p.m. to 7 a.m.), as shown in Table 3.10-5 and Table 3.10-6;
- generate excessive groundborne vibration or groundborne noise levels. Based on Caltrans and FTA guidance, groundborne vibration is considered significant if it would:
  - exceed FTA's maximum acceptable vibration standard with respect to human response of 80 VdB for residential uses as shown in Table 3.10-3 or exceed Caltrans's recommended standards with respect to the prevention of structural building damage (0.2 and 0.08 in/sec PPV for normal and historical buildings, respectively) as shown in Table 3.10-4.

# IMPACT ANALYSIS

## Impact 3.10-1: Generate Excessive Noise Levels During Construction

Proposed project construction would result in elevated noise levels at the single-family residences along Inland Passage Way and could result in the potential for annoyance. However, noise generated by construction activity would be temporary, intermittent, and periodic, and would occur during daytime hours when people are less sensitive to noise, pursuant to Section 8.20.110 of the Municipal Code. Therefore, this impact would be **less than significant**.

The proposed project would include modifications to the CTF, installation of an effluent discharge pipeline, and construction of a levee crossing and outfall structure. Construction of the proposed project, except for any decommissioning of Storage Ponds A, B, and C, is anticipated to begin in spring 2021 and be completed by the end of 2021. All three major components of project construction would occur concurrently to the extent feasible, though the duration of each component would vary. Construction would occur from 7 a.m. to 5 p.m. on weekdays, pursuant to Section 8.20.110 of the City of Lathrop Municipal Code. Construction activities would likely include heavy equipment such as excavators, dump trucks, front end loaders, compactors, dozers, and a crane. Additionally, a vibratory hammer connected to a crane operated from the levee crown would be used to build a coffer dam during construction of the outfall structure. Reference noise levels of heavy equipment likely to be used in construction activities are summarized below in Table 3.10-8.

The combined noise levels generated by construction activity would fluctuate daily depending on the type and number of vehicles and equipment used, as well as the duration in which they are used. The effects of construction noise largely depend on the type of construction activities occurring on any given day; the noise levels generated by those activities; distances to noise-sensitive receptors; any noise-attenuating features such as topography, vegetation, and existing structures; and existing ambient noise levels.

**Table 3.10-8 Noise Levels Generated by Construction Equipment**

| Equipment Type | Typical Noise Level (dB) at 50 feet |
|---|---|
| Backhoe | 80 |
| Compactor | 80 |
| Concrete Saw | 90 |
| Crane | 85 |
| Dozer | 85 |
| Dump Truck | 84 |
| Excavator | 85 |
| Front End Loader | 80 |
| Generator | 82 |
| Paver | 85 |
| Pickup Truck | 55 |
| Pumps | 77 |
| Rollers | 85 |
| Vibratory Pile Driver/Hammer | 95 |

Source: FHWA 2006:3

The CTF modifications would involve installing new PVC pipelines, installing new pipeline valves and temperature monitoring controls, decommissioning of existing ponds, and disconnecting and reconnecting existing recycled water lines. The most commonly used pieces of equipment would include hand tools, water trucks, work trucks, and generators. However, the loudest pieces of equipment that would be used during CTF modifications were used in construction noise modeling to account for the loudest-possible scenario. A flatbed truck, a concrete saw, and a rock drill operating in close proximity to each other would produce combined noise levels of 86 dB $L_{eq}$ and 92 dB $L_{max}$. The nearest noise-sensitive receptors to the CTF are two single family residences, one located approximately 550 feet south of Pond B and the other located approximately 1,010 feet east of Pond S5. Pond B and Pond S5, as well as these single-family residences, are shown in Figure 3.10-1. Construction-generated noise levels could reach 58 dB $L_{eq}$ and 65 dB $L_{max}$ at the single-family residence located south of Pond B and 51 dB $L_{eq}$ and 58 dB $L_{max}$ at the single-family residence located east of Pond S5. Noise generated by construction activities would be temporary, intermittent, and periodic in nature and would occur during the exempt daytime hours from 7 a.m. to 5 p.m. on weekdays, pursuant to Section 8.2.110 of the City of Lathrop Municipal Code.

The proposed effluent discharge pipeline would be created by replacing existing pipe, reusing existing pipe, and installing new pipe depending on the existing pipeline infrastructure along the length of the proposed effluent discharge pipeline. The segment of the proposed effluent discharge pipeline along Sadler Oak Drive would reuse, rather than replace, an existing pipeline. Because no construction activities would be required for construction of the effluent discharge pipeline along this roadway, the single-family residences to the north of Sadler Oak Drive would not experience elevated noise levels due to project-related construction activities. However, the residences along the east side of Inland Passage Way would be exposed to construction noise during construction of the proposed effluent discharge pipeline because a new pipe would be installed along the west side of Inland Passage Way. Construction of the effluent discharge pipeline would be implemented either by one construction crew or two construction crews working simultaneously on different parts of the pipeline. Noise levels at nearby receptors would vary depending on the number of crews and each crew's distance from various receptors. Additionally, the homes along the east side of Inland Passage Way would be exposed to construction noise during construction of the proposed levee crossing and outfall structure, which is shown in Figure 3.10-1 along the river adjacent to the intersection of Inland Passage Way and Emory Oak Place.

Table 3.10-9 shows the estimated noise levels that nearby residential receptors may experience during the various components of proposed project construction. Refer to Figure 3.10-1 for a map of the project site and nearby residences. The modeled noise levels are conservatively high because they do not account for any attenuation provided by existing structures, landscaping, or topography. The acoustical center approach was used to model noise levels at residential receptors, meaning that the distances used to calculate noise levels represent the distance from the center of noise-generating activity to the nearest residential property line. All noise level calculations assumed the operation of three pieces of heavy equipment in close proximity to each other, producing a combined noise level. Noise level calculations used reference noise levels for the loudest piece of equipment used for the specific component of proposed project construction (i.e., effluent discharge pipeline, levee crossing, and outfall structure) as well as a front-end loader and a dump truck, which would both be regularly used pieces of noise-generating heavy equipment for all project components. The loudest piece of equipment used for each component of project construction as well as modeled noise levels at the nearest receptors are shown in Table 3.10-9. Refer to Appendix F for detailed noise calculations.

As shown in Table 3.10-9, construction-generated noise levels would range from 70 to 82 dB $L_{eq}$ and 74 to 88 dB $L_{max}$ at the nearest single-family residences along the east side of Inland Passage Way. Other residences farther from construction activities would also experience increased noise levels. However, noise levels would decrease with increased distance from construction activity, as shown in Table 3.10-9. During the loudest construction activity, construction of the effluent discharge pipeline, the City's exterior noise standards of 55 dB $L_{eq}$ and 75 dB $L_{max}$ would be exceeded up until a distance of 816 feet and 225 feet, respectively. Based on these distances and accounting for attenuation provided by intervening buildings, approximately 30 residences would be located within the over-55 dB $L_{eq}$ zone and approximately 17 residences would be located within the over-75 dB $L_{max}$ zone.

Although proposed project construction would result in elevated noise levels at these single-family residences, noise generated by construction activities would be temporary, intermittent, and periodic in nature. Additionally, construction of the proposed effluent discharge pipeline would move linearly along Inland Passage Way and would, therefore, not affect the same receptors for the entire duration of construction such that any one receptor would be exposed to elevated noise levels for extended periods of time. If two construction crews worked simultaneously on different parts of the pipeline, it is possible that these crews would work close enough to each other for their noise levels to combine at a single receptor. However, it would be unlikely for two crews to work in close proximity for extended periods of time, and the difference in noise level from one to two crews working in close proximity would be imperceptible (i.e., under 3 dB). As shown in Table 3.10-9, a single construction crew would generate noise levels of 82 dB $L_{eq}$ and 88 dB $L_{max}$ at the nearest residential receptor. Two construction crews working within 50 feet of each other along the pipeline, one of which was located adjacent to the nearest residential receptor, would generate combined noise levels of 84 dB $L_{eq}$ and 90 dB $L_{max}$ at the nearest residential receptor, which is less than 3 dB greater than the noise level produced by a single construction crew and, thus, is an imperceptible difference (Caltrans 2013a:2-44).

Staging of equipment and materials during construction would occur at the CTF, along the west side of Inland Passage Way, and adjacent to the intersection of Inland Passage Way and Sadler Oak Drive. Figure 3.10-1 shows the locations of all proposed staging areas. Staging areas would not be located any closer to noise-sensitive receptors than the construction sites discussed above. Therefore, staging areas would generate similar, if not lower, noise levels than active construction sites.

**Table 3.10-9 Exterior Noise Exposure Levels at Noise-Sensitive Receptors during Project Construction**

| Construction Activity | Approximate Distance to Nearest Residential Receptor (feet)[1] | Loudest Piece of Equipment Used and its Noise Level ($L_{max}$) at 50 feet | Exterior Noise Level at the Nearest Residential Receptor (dB)[2,3] $L_{eq}$ | Exterior Noise Level at the Nearest Residential Receptor (dB)[2,3] $L_{max}$ | Exterior Noise Level at Residential Receptors 25 feet away from the Nearest Residential Receptor $L_{eq}$ | Exterior Noise Level at Residential Receptors 25 feet away from the Nearest Residential Receptor $L_{max}$ | Exterior Noise Level at Residential Receptors 50 feet away from the Nearest Residential Receptor $L_{eq}$ | Exterior Noise Level at Residential Receptors 50 feet away from the Nearest Residential Receptor $L_{max}$ |
|---|---|---|---|---|---|---|---|---|
| Effluent Discharge Pipeline | 65 feet | Concrete Saw, 90 dB | 82 | 88 | 79 | 85 | 76 | 82 |
| Levee Crossing | 170 feet | Excavator, 85 dB | 70 | 74 | 69 | 73 | 67 | 71 |
| Outfall Structure | 270 feet | Pile driver, 95 dB | 70 | 76 | 69 | 75 | 68 | 74 |

1 Distances listed here represent the distance between the acoustical center of noise-generating construction activity and the nearest residential property line.

2 Noise level calculations used reference noise levels for the loudest piece of equipment that would be used for the specific component of project construction (i.e., effluent discharge pipeline, levee crossing, and outfall structure) as well as a front-end loader and an excavator. Noise level estimates assume all equipment is properly maintained and fitted with all appropriate operational noise control devices, per manufacturer specifications.

3 Refer to Appendix F for detailed construction noise calculations.

Note: dB = decibel

Source: Data modeled by Ascent Environmental in 2020

Anticipated haul and construction access routes, shown in Figure 2-8 in Chapter 2, "Project Description," use several streets within residential areas, including Golden Valley Parkway, Brookhurst Boulevard, Inland Passage Way, and Sadler Oak Drive. A total of 798 dump truck round-trips would be required to import and export material to and from the site during construction of modifications at the CTF and the effluent pipeline between the CTF and the landside toe of the levee (see Appendix B). To import and export the material required to construct the levee crossing and outfall, a total of 267 dump truck and 117 cement truck round-trips would be required. Haul trips for construction of each project component would be spread out over the duration of the specific project component (i.e., 24 weeks for the effluent pipeline, 22 weeks for CTF modifications, and 8 weeks for the levee crossing and outfall).

All noise-generating construction activity, including hauling of materials and equipment to and from staging areas and construction sites, would occur during the daytime hours from 7 a.m. to 5 p.m. on weekdays, pursuant to Section 8.2.110 of the City of Lathrop Municipal Code and consistent with Mitigation Measure 4.6-1 from the 2001 EIR for the Lathrop Water, Wastewater, and Recycled Water Master Plan (City of Lathrop 2001:4.6-10 to 4.6-11), incorporated by reference in the 2013 CTF IS/MND (City of Lathrop 2013), which requires construction activities to occur between 7:00 a.m. and 7:00 p.m. on weekdays, and therefore, would not result in sleep disruption. In summary, although project construction activity would result in elevated noise levels at the single-family homes along Inland Passage Way, construction noise would be temporary, intermittent, and periodic, and would occur during daytime hours when people are less sensitive to noise. Therefore, this impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.10-2: Generate Excessive Operational Noise Levels

Operation of the proposed project would not introduce new long-term stationary noise sources located close to noise-sensitive receptors, increase traffic noise, or expose any noise-sensitive receptors to noise levels that exceed any noise standards. Therefore, this impact would be **less than significant**.

From the perspective of noise generation, long-term operations and maintenance activities would be very similar to, if not indistinguishable from, existing conditions at existing noise-sensitive receptors because effluent river discharge would be controlled using a newly automated system at the CTF, and all noise-generating mechanical equipment, such as water pumps and generators, would be housed permanently at the CTF.

Changes to CTF operation would include a dechlorination process using a sodium bisulfite injector at the chlorine contact basin that would be activated by the Crossroads Pump Station as needed to discharge dechlorinated effluent to the river. The dechlorination process and the pumping of dechlorinated effluent to the river would utilize both existing pumps and one new pump that would generate noise. The new pump would operate intermittently when needed to inject sodium bisulfite into the treated effluent to provide dechlorination in compliance with the National Pollutant Discharge Elimination System permit prior to discharge to the river.

The nearest noise-sensitive receptors to pump stations at the CTF are two single family residences, one located approximately 1,580 feet south of the Crossroads Pump Station and the other located approximately 2,060 feet east of the PMP-1 Pump Station. The levels of exterior noise exposure at the residence closest to the Crossroads Pump Station would be 38 dB $L_{eq,}$ and 41 dB $L_{max}$, and the levels of exterior noise exposure at the residence closest to the PMP-1 Pump Station would be 35 dB $L_{eq,}$ and 38 dB $L_{max}$. Thus, noise exposure at both residences would not exceed the City's daytime or nighttime standards for rural suburban residences. Refer to Appendix F for detailed noise modeling calculations.

Expansion of the CTF to accommodate treatment of up to 6.0 mgd at buildout was previously addressed in the 2013 CTF IS/MND and is not addressed in this EIR. The 2013 CTF IS/MND determined that there would be a less-than-significant impact from long-term, operational increases in stationary- and area-source noise levels with implementation of Mitigation Measure 4.6-4, which provides instruction for the location and shielding of noise-generating equipment (City of Lathrop 2013:3-71).

The effluent discharge pipeline would not generate noise at any sensitive receptors because it would be subterranean. The outfall would not utilize any noise-generating equipment and the discharge would occur below the surface of the water. Therefore, the discharge also would not generate noise at any sensitive receptors.

The proposed project would not require any long-term staffing changes at the CTF. Operations at this facility would continue to be monitored and controlled using the existing supervisory control and data acquisition system in the administration building at the CTF, and effluent river discharge would be controlled using an automated system. Therefore, after construction of project facilities is complete, the proposed project would result in minimal, if any, new vehicle trips to and from the area and would not result in increased ambient noise levels.

For the reasons listed above, operation of the proposed project would not introduce new long-term noise sources or increased traffic that would expose noise-sensitive receptors to noise levels that exceed noise standards. Therefore, this impact would be **less than significant**.

## Mitigation Measures

No mitigation is required for this impact.

## Impact 3.10-3: Generate Excessive Ground-borne Vibration Levels During Construction

Vibration generated by pile driving and other construction activities would not have the potential to cause structural damage or human annoyance. This impact would be **less than significant**.

Construction activities associated with the proposed project would generate varying degrees of temporary ground vibration, depending on the specific construction equipment used and activities involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. The effects of ground vibration may be imperceptible at the lowest levels, result in low rumbling sounds and detectable vibrations at moderate levels, and, at high levels, cause annoyance, sleep disturbance, or damage to nearby structures. Because modifications to the CTF would not require the use of vibration-intensive equipment and construction activities would not occur within close proximity to any vibration-sensitive receptors, construction activity associated with implementation of the CTF modifications would not cause structural damage or human annoyance, and project component is not discussed further.

Pile driving and blasting are the types of construction activities that typically generate the highest vibration levels and are, therefore, of greatest concern when evaluating construction-related vibration impacts. Pile driving would be conducted during construction of the proposed outfall structure along the east bank of the San Joaquin River, shown in Figure 3.10-1. Pile driving generates a ground vibration level of 0.644 in/sec PPV and 104 VdB at 25 feet (FTA 2018:184). Vibration from pile driving could exceed the threshold of significance of 0.2 in/sec PPV for normal buildings located within 55 feet of pile driving, and with respect to human response, the threshold of 80 VdB for residential land uses within 155 feet of pile driving. Refer to Appendix F for detailed vibration modeling calculations. Pile driving would be used to build a coffer dam at the outfall location, which is located over 200 feet away from the closest residential building along Inland Passage Way. Therefore, pile driving during construction of the proposed outfall structure would not result in vibration impacts.

Construction of the proposed effluent discharge pipeline and levee crossing would occur closer to the residences along Inland Passage Way but would require the use of less vibration-intensive equipment, such as loaded trucks operating within the project site and traveling along the haul route. Loaded trucks generate a ground vibration level of 0.076 in/sec PPV and 86 VdB at 25 feet (FTA 2018:184). Vibration from loaded trucks could exceed the threshold of significance of 0.2 in/sec PPV for normal buildings located within 13 feet of truck activity, and with respect to human response, the threshold of 80 VdB for residential land uses within 40 feet of truck activity. Refer to Appendix F for detailed vibration modeling calculations. Construction of the proposed effluent discharge pipeline and levee crossing would occur more than 40 feet from residential receptors. Additionally, all residential structures located along the haul route, shown in Figure 2-8 in Chapter 2, "Project Description," are located farther than 40 feet from the directional centerline of the roadway. In summary, proposed project construction activities, including pile driving, onsite loaded truck activity, and hauling of materials and equipment, would not generate vibration levels that exceed Caltrans' recommended standards with respect to the prevention of structural building damage of 0.2 in/sec PPV for normal buildings or exceed FTA's maximum acceptable vibration standard with respect to human response of 80 VdB for residential uses. Thus, this impact would be **less than significant.**

## Mitigation Measures

No mitigation is required for this impact.

# 4 CUMULATIVE IMPACTS

## 4.1 INTRODUCTION TO THE CUMULATIVE ANALYSIS

This Draft EIR provides an analysis of cumulative impacts of the City of Lathrop CTF Surface Water Discharge Project taken together with other past, present, and probable future projects producing related impacts, as required by Section 15130 of the State CEQA Guidelines. The purpose of this analysis is twofold: first, to determine whether the overall long-term impacts of all such projects would be cumulatively significant, and second, to determine whether the proposed project's incremental contribution to any such cumulatively significant impacts would be "cumulatively considerable" (and thus significant). (See State CEQA Guidelines Sections 15130[a]–[b], Section 15355[b], and Section 15064[h; and *Communities for a Better Environment v. California Resources Agency* [2002] 103 Cal. App. 4th 98, 120.) In other words, the required analysis first creates a broad context in which to assess cumulative impacts, viewed on a geographic scale beyond the project site itself, and then determines whether the proposed project's incremental contribution to any significant cumulative impacts from all projects is itself significant (i.e., "cumulatively considerable").

Cumulative impacts are defined in State CEQA Guidelines Section 15355 as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact occurs from "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (State CEQA Guidelines Section 15355[b]).

Consistent with State CEQA Guidelines Section 15130, the analysis of cumulative impacts in this Draft EIR focuses on significant and potentially significant cumulative impacts. Section 15130(b) of the State CEQA Guidelines provides, in part, the following:

> The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

A proposed project is considered to have a significant cumulative effect if:

- the cumulative effects of development without the project are not significant and the project's additional impact is substantial enough, when added to the cumulative effects, to result in a significant impact, or
- the cumulative effects of development without the project are already significant and the project contributes measurably to the effect.

The term "measurably" is subject to interpretation. The standards used herein to determine measurability are that the impact must be noticeable to a reasonable person, or must exceed an established threshold of significance (defined throughout the resource sections in Chapter 3 of this Draft EIR).

# 4.2 CUMULATIVE IMPACT APPROACH

State CEQA Guidelines Section 15130 identifies two basic methods for establishing the cumulative environment in which a project is considered: the use of a list of past, present, and probable future projects or the use of development projections from an adopted general plan, other regional planning document, or a certified EIR for such a planning document. This cumulative analysis uses a combination of the "list" approach and the "projections" approach to identify the cumulative setting. The effects of past and present projects on the environment are reflected by the existing conditions in the project area.

Probable future projects are those in the project vicinity that have the possibility of interacting with the project to generate a cumulative impact and:

- are partially occupied or under construction;
- have received final discretionary approvals;
- have applications accepted as complete by local agencies and are undergoing environmental review; or
- are otherwise considered likely to be developed, based on historic development patterns, including the rate of development, in the City of Lathrop.

# 4.3 CUMULATIVE SETTING

## 4.3.1 Geographic Scope

The geographic area that could be affected by the proposed project and is appropriate for a cumulative impact analysis varies depending on the environmental resource topic, as presented in Table 4-1.

**Table 4-1 Geographic Scope of Cumulative Impacts**

| Resource Topic | Geographic Area |
|---|---|
| Air Quality | Regional (pollutant emissions that affect the San Joaquin Valley Air Basin) and immediate project vicinity (pollutant emissions that are highly localized) |
| Terrestrial Biological Resources | SJMSCP Plan Area, San Joaquin County, City of Lathrop |
| Aquatic Biological Resources | San Joaquin River basin |
| Cultural, Tribal Cultural, and Paleontological Resources | Local (limited to the project site), with regional implications |
| Energy | Pacific Gas and Electric Company service area |
| Greenhouse Gas Emissions and Climate Change | Global |
| Hazards and Hazardous Materials | Local (limited to the project site) |
| Hydrology and Water Quality | San Joaquin River Basin, City of Lathrop |
| Noise and Vibration | Local (immediate project vicinity where project-generated noise could be heard concurrently with noise from other sources) |
| Utilities and Service Systems | Local service areas |

Note: SJMSCP = *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan*.

Source: Compiled by Ascent Environmental in 2020

## 4.3.2 Projections

The cumulative setting for the analysis uses growth projections included in the *City of Lathrop Recycled Water Master Plan* (EKI 2019a) and available from the California Department of Finance statistics (DOF 2016). (See Table 2-1 in Chapter 2, "Project Description.")

## 4.3.3 Related Projects

Tables 4-3, 4-3, and 4-4 and Figure 4-1 show the probable future projects considered in the cumulative analysis. These projects meet the criteria described above: They are in the project vicinity and have the possibility of interacting with the proposed project to generate a cumulative impact. Table 4-2 identifies development projects. Table 4-3 identifies capital improvement or infrastructure projects. Table 4-4 identifies projects identified in the Lathrop Integrated Water Resources Master Plan, which includes improvement projects summarized in the Water System Master Plan, Wastewater System Master Plan, and Recycled Water System Master Plan (EKI 2019a, 2019b, 2019c). These probable future projects were considered in the development and analysis of the cumulative settings and impacts for most resource topics within the geographic scope of each resource topic (as listed in Table 4-1). Past and present projects in the vicinity were also considered as part of the cumulative setting, as they contribute to the existing conditions against which the proposed project's and each probable future project's environmental effects are compared.

**Table 4-2 Approved and Pending Commercial and Residential Development Projects in Lathrop**

| Map Number | Project | Address | Assessor's Parcel Number(s) | Single-Family Development Units | Apartment Units | Commercial (square feet) | Industrial/ Warehouse (square feet) |
|---|---|---|---|---|---|---|---|
| 1 | CUP-19-11 - Fairfield Inn - 90 rooms | NA | 191-760-02 | — | — | 50,458 | — |
| 2 | Multi-Entitlement - Lathrop Towne Centre | 17100 Golden Valley Parkway | 191-119-049 | — | — | 126,000 | — |
| 3 | Multi-Entitlement - Lathrop Towne Centre - Hotel - 117 Rooms | 17100 Golden Valley Parkway | 191-119-049 | — | — | 60,000 | — |
| 4 | Multi-Entitlement - North Crossroads Business Park | 500 and 1300 E. Louise Avenue | 198-120-08 and 198-140-16 | — | — | — | 1,000,000 |
| 5 | Multi-Entitlement - Watt Commercial - Lathrop Market Place | NA | 191-760-02 thru -12, -16 through 21 | — | — | 175,000 | — |
| 6 | SPR-18-40 - Phelan Lathrop Gateway - Phase I | Various | 241-400-09 through -13, 241-400-29 through -33, and 241-280-12 | — | — | — | 990,525 |
| 7 | SPR-18-40 - Phelan Lathrop Gateway - Phase II | Various | | — | — | — | 890,350 |
| 8 | SPR-18-40 - Phelan Lathrop Gateway - Phase III | Various | | — | — | — | 1,155,050 |
| 9 | SPR-18-47 - South Lathrop Commerce Center Remaining Phase 1 and Phase 2 | Various | 241-030-15, -17 through -26 | — | — | — | 3,826,000 |
| 10 | MSPR-19-163 - Simwon Expansion | 18231 Murphy Parkway | 198-190-30 | — | — | — | 87,435 |
| 11 | SPR-20-06 - CFT Phase 2 | 15107 and 15135 Old Harlan Road | 196-110-29 and -30 | — | — | 2,470 | — |
| 12 | MSPR-14-34 - Mossdale Apartments | 18007, 18149, and 18250 S. Manthey Road | 241-020-61, -65, and -66 | — | 266 | — | — |
| 13 | CLSP - Saybrook - 3789 Triangle - Construction of First 4 Tracts (Beginning Soon) | NA | NA | 418 | — | — | — |
| | CLSP - Saybrook - 3967 - VTM-18-46 (Approved) | NA | NA | 113 | — | — | — |
| | CLSP - Tract 3647 - Phase 2 (Approved in 2007) | NA | NA | 1,040 | — | — | — |
| 14 | River Islands Phase 1 (Approved) - Remaining Dwelling Units (based on total number of dwelling units per Tract 3694 [4,284] minus the total number of lots per Final Maps approved [2,135 as of 03.02.20]) | NA | NA | 2,149 | — | 3,543,522 | — |
| 15 | River Islands Phase 2 (Approved and Proposed) – 6,716 dwelling units and 1,980,000 SF of commercial/office approved (2003) but not constructed. Applicant is proposing an increase of 4,010 dwelling units and reduction of 142,500 SF of commercial/office. Currently undergoing CEQA review by City of Lathrop | NA | NA | 10,726[1] | — | 1,837,500 | — |
| | TOTALS | | | **14,446** | **266** | **5,794,950** | **7,949,360** |

Note: NA = not available.

1 Includes a mix of single family, multiple family, and transit-oriented village residences.

Sources: Woodard & Curran 2020 (River Islands Phase 2); data also provided by the City of Lathrop in March 2020

**Table 4-3 Lathrop Capital Improvement and Nearby Related Infrastructure Projects**

| Map Number | Project | Project Description | Address |
|---|---|---|---|
| City of Lathrop | | | |
| 16 | Golden Valley Parkway Extension and Bridge | Golden Valley Parkway would be extended south from Brookhurst Boulevard along the Golden Valley Parkway alignment as shown in the Central Lathrop Specific Plan and Golden Valley Parkway Bridge would be constructed over the San Joaquin River. Once completed, the Manthey Road Bridge would be removed. Construction is expected to begin in spring 2022 and be completed by the end of 2024. | Golden Valley Parkway and Brookhurst Boulevard to the San Joaquin River |
| 17 | Lathrop Gateway Business Park Phase 1 | Phase 1 provides numerous infrastructure improvements including the extension of D'Arcy Parkway from Yosemite Avenue to the railroad tracks, a regional sewer pump station, and reconstruction of Yosemite Avenue in front of the project in addition to 990,000 square feet of warehousing with two buildings. | Yosemite Avenue and D'Arcy Parkway |
| 18 | Lathrop Road and I-5 Improvements | The ultimate interchange improvements include relocating and widening northbound and southbound ramps, signal improvements, and retaining wall construction. Currently the project is on hold and timing is dictated by the development of central Lathrop. | Lathrop Road and I-5 |
| 19 | Louise Ave and I-5 Improvements | Complete the ultimate interchange improvements at Louise Avenue and I-5. The ultimate interchange improvements include widening northbound ramps, relocating and widening southbound ramps, signal improvements, and retaining wall construction. | Louise Avenue and I-5 |
| 20 | Mossdale South Neighborhood Park Improvements | A neighborhood park that will be for mostly passive uses and is intended to include a covered picnic area with barbecue, landscaped walking paths, open turf area with trees, a play structure for both toddlers and larger children, with an option for half-court basketball. | Inland Passage Way and Golden Spike Trail |
| 21 | SR 120 and Yosemite Avenue Interchange Project | This project will construct the ultimate interchange improvements at SR 120/ Yosemite Avenue. Phase 1 construction will involve widening Yosemite Avenue (south of SR 120) to four lanes, installing traffic signal control at both ramp-terminal intersections, and widening the eastbound and westbound on-/off-ramps. | SR 120 at Yosemite Avenue and Guthmiller Road |
| City of Manteca | | | |
| 22 | Manteca Wastewater Conveyance to the Delta-Mendota Canal | Manteca is in the preliminary feasibility phase of a project to convey Manteca Water Quality Control Facility (WQCF) effluent to the Delta-Mendota Canal near Tracy, California. This project is scheduled to be implemented within the next few years, if determined to be feasible. Manteca is planning to use the existing WQCF outfall pipeline as part of the system to convey effluent to the Delta-Mendota Canal. | Approximately, from Manteca west to the Delta-Mendota Canal west of Tracy |

| Map Number | Project | Project Description | Address |
|---|---|---|---|
| 23 | SR 120 - McKinley Avenue Interchange Project | The approved project alternative is a partial cloverleaf (Type L-9) interchange that includes on- and off-ramps, two new ramp bridges, auxiliary lanes on SR 120, ramp metering and roadway, and improvements on McKinley Avenue, including a Class 1 bike path. | SR 120 and McKinley Avenue, Manteca, CA |
| **Reclamation District 17** | | | |
| 24 | Phase III Levee Seepage Repair Project | The project will implement levee improvements at various locations along the landside toe of levees to increase resistance to under-seepage and through-seepage, and ultimately bring the approximately 19-mile levee system into compliance with applicable federal and state standards for the levees protecting urban areas. Project elements closest to the proposed outfall location include Project Elements IVa, IVc, Va-VIa.1, VIa.4, VIb, and VIcde. | The Reclamation District 17 West Levee is located along the east side of the San Joaquin River in Lathrop and extends to the north and south of Lathrop |

Notes: I- = Interstate; SR = State Route.

Because some of the projects cover a large area or multiple parcels, the mapped locations of the cumulative projects shown in Figure 4-1 are approximate.

Source: Compiled by Ascent Environmental in 2020

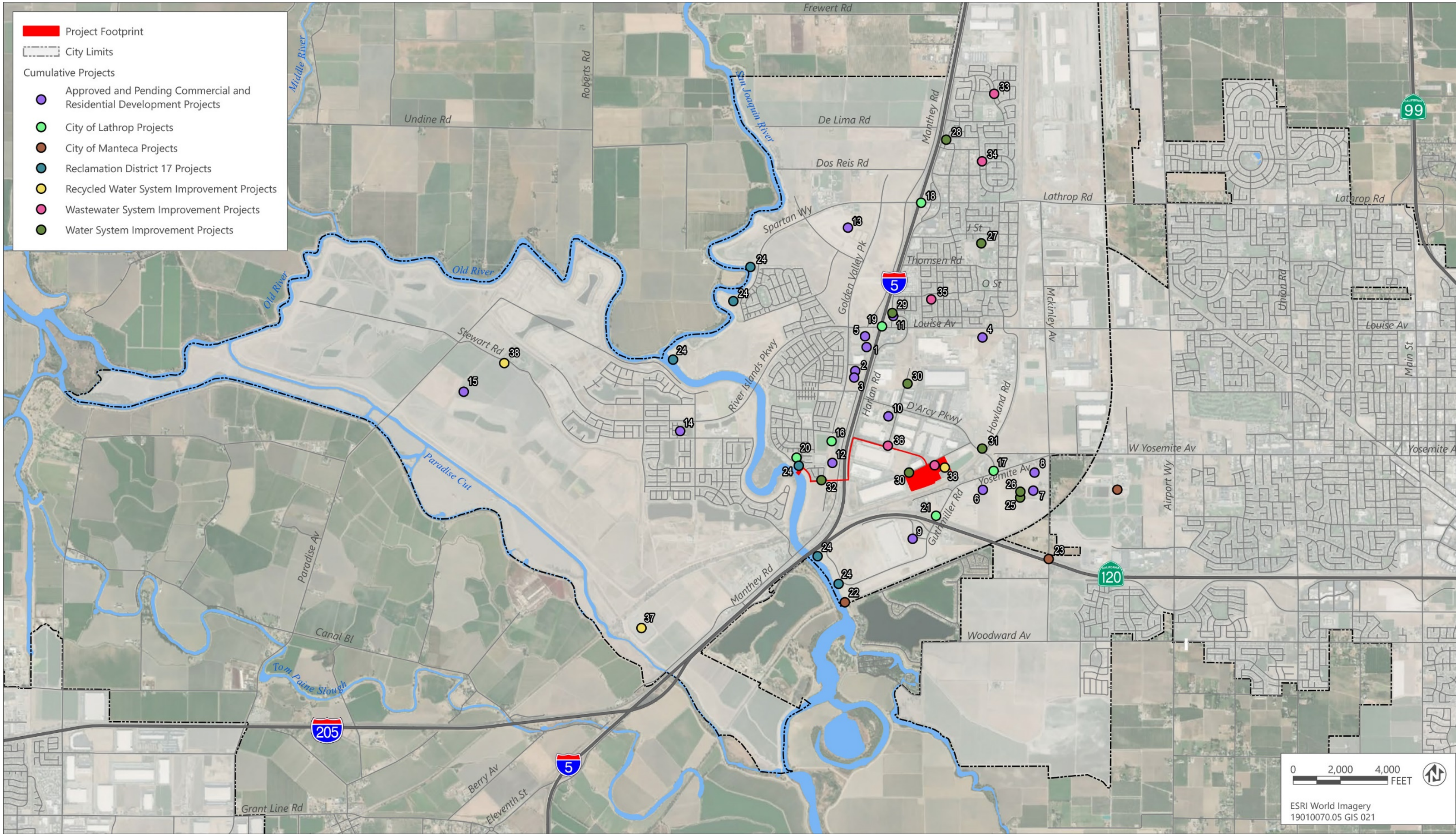
**Table 4-4 Lathrop Integrated Water Resources Master Plan Projects**

| Map Number | Project | Project Description | Address |
|---|---|---|---|
| | | **Water System Improvement Projects** | |
| Not mapped | WS-1 Sustainable Ground Water Management Act Compliance | Continued Sustainable Ground Water Management Act efforts including development of a Groundwater Sustainability Plan. | Citywide |
| 25 | WS-3 Well 21 WTF Phase 2 Improvements | The project will:<br>▶ Install Filter No. 3 and piping; site work; sludge tank, piping, and pumps; and startup;<br>▶ Install a 12-inch parallel raw water pipeline from McKinley to Well 21; and<br>▶ Replace Well 21 pump and modify Well 10 pump. | Southwest of the intersection of Yosemite Avenue and McKinley Avenue |
| 26 | WS-4 Well 21 WTF Tank, Booster Pump Station, and Transmission Main | The project will:<br>▶ Install 6.5 mgd of pumping capacity at the Booster Pump Station,<br>▶ Install new 16-inch transmission main from Well 21 WTF to Yosemite Avenue, and<br>▶ Construct 1 million gallons of storage at Well 21 WTF Tank. | Southwest of the intersection of Yosemite Avenue and McKinley Avenue |
| 27 | WD-1 Booster Pump Station 1 Pipeline Replacement and Residential Fire Flow Improvement Project | The project will upsize existing pipelines. | Within the Mossdale Landing East area of the City |
| 28 | WD-2 Booster Pump Station 3 Pipeline Replacement and Harlan Road Fire Flow Improvement Project | The project will upsize existing pipelines. | Within the Mossdale Landing East area of the City |
| 29 | WD-4 Old Harlan Fire Flow Improvement Project | The project will install new pipeline. | Old Harlan Road north of Louise Avenue |
| 30 | WD-5 Crossroads Fire Flow Improvement Project | The project will replace hydrants at Murphy Parkway and Christopher Way with 8-inch hydrants and laterals | Murphy Parkway north of D'Arcy Parkway and Christopher Way southwest of Tesla Way |
| 31 | WD-7 Booster Pump Station 2 Pipeline Replacement Project | The project will upsize existing pipelines. | North of D'Arcy Parkway and Howland Avenue |
| 32 | WD-9 Sadler Oak Transmission Improvement Project | The project will upsize existing 8-inch to 12-inch-diameter water supply pipes along Sadler Oak Road. | Sadler Oak Road between Inland Passage Way and Manthey Road |
| | | **Wastewater System Improvement Projects** | |
| 33 | WW-1 Stonebridge Gravity Main Replacement and Pump Station Upgrade | The project will install new gravity main, pump station upgrade, replace sewer laterals, and rehabilitate manholes. | Northern portion of Mossdale Landing East |
| 34 | WW-2A Woodfield West Deficiency Project - Alternative A | The project will install new gravity main, replace sewer laterals, and rehabilitate manholes. | Northern portion of Mossdale Landing East |

| Map Number | Project | Project Description | Address |
|---|---|---|---|
| 35 | WW-5 Easy Court/O Street Gravity Main Replacement Project | The project will install new gravity mains, replace sewer laterals, reconnect back alley laterals to replacement sewer, and rehabilitate manholes. | Central portion of Mossdale Landing East |
| 36 | WW-7 Crossroads Gravity Main Replacement Project | The project will install new gravity mains, replace sewer laterals, and rehabilitate manholes. | Tesla Way and Murphy Parkway |
| | | Recycled Water System Improvement Projects | |
| 37 | Recycled Water System Phase 2A Improvements | Components of Phase 2A that have yet to be completed include:<br>▸ Converting the low-pressure PMP-10 to a high-pressure pump station to effectively convey recycled water from storage pond S16,<br>▸ Installing flow meters and automatic control valves with radiotelemetry at each land application area turnout location to facilitate automated delivery of recycled water to the land application areas, and<br>▸ Establishing Supervisory Control and Data Acquisition controls on pump and storage ponds to automate system operations. | *Multiple* |
| 38 | Recycled Water System Phase 2B Improvements | Components of Phase 2B include:<br>▸ Increasing the capacity of PMP-1 in conjunction with the installation of storage pond S-X (located directly north of storage pond S5) and<br>▸ Installing a new pond and pump station in the western portion of the City, potentially at locations S13 and PMP-6, to meet storage requirements and to meet system pressure criteria in Phase 2B. | *Multiple* |

Notes: mgd = million gallons per day; WTF = Water Treatment Facility.

Sources: EKI 2019a, 2019b, and 2019c




Source: Adapted by Ascent Environmental in 2020

Figure 4-1 Cumulative Projects

# 4.4 ANALYSIS OF CUMULATIVE IMPACTS

The following sections discuss cumulative effects anticipated from implementation of the proposed project, together with related projects, development projects, and capital improvement or infrastructure projects, for each of the environmental issue areas evaluated in this Draft EIR. The analysis complies with Section 15130(b) of the State CEQA Guidelines, which specifies that the "discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact."

When considered in relation to other reasonably foreseeable projects, cumulative impacts on some resources would be significant and more severe than those caused by the proposed project alone.

For the purposes of this EIR, the project would result in a significant cumulative effect if:

- the cumulative effects of related projects (past, current, and probable future projects) are not significant and the incremental impact of implementing the proposed project is substantial enough, when added to the cumulative effects of related projects, to result in a new cumulatively significant impact; or
- the cumulative effects of related projects (past, current, and probable future projects) are already significant and implementation of the proposed project makes a considerable contribution to the effect. The standards used herein to determine a considerable contribution are that either the impact must be substantial or must exceed an established threshold of significance.

This cumulative analysis assumes that all mitigation measures identified in Chapter 3 to mitigate project impacts are adopted and implemented. The analysis herein analyzes whether, after implementation of project-specific mitigation that minimize environmental effects, the residual impacts of the project would cause a cumulatively significant impact or would contribute considerably to existing/anticipated (without the project) cumulatively significant effects. Where the project would so contribute, additional mitigation is recommended where feasible.

## 4.4.1 Air Quality

Construction of the proposed project would result in emissions of criteria air pollutants (e.g., particulate matter [$PM_{10}$ and $PM_{2.5}$]) and precursors (e.g., oxides of nitrogen [$NO_X$] and sulfur, and reactive organic gases [ROG]) in San Joaquin County within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The county is currently in nonattainment for ozone and $PM_{2.5}$ with respect to the California ambient air quality standard and for ozone and $PM_{2.5}$ with respect to the national ambient air quality standards.

Ozone concentrations result from the cumulative emissions from numerous sources in the region and transport from outside the region. Ozone is formed in chemical reactions involving $NO_X$, ROG, and sunlight. All but the largest individual sources emit $NO_X$ and ROG in amounts too small to have a measurable effect on ambient ozone concentrations by themselves. However, when all sources throughout the region are combined, they result in severe ozone problems. Therefore, emissions of $NO_X$, ROG, and $PM_{10}$ from cumulative development are significant in the air basin; the discussion below addresses whether the project's contribution is considerable and therefore significant.

Air districts in California develop air quality attainment plans, which include a multitude of air pollution control strategies to attain the federal ozone standard by the earliest practicable date. In developing air quality attainment plans, air districts account for the emissions from all present and future development in the region by relying on city and county general plans. Because the proposed project would be consistent with existing uses and with the land use designations in the General Plan, emissions associated with implementation of the proposed project are accounted for in SJVAPCD's air quality attainment plan (see Section 3.2, "Air Quality," for a detailed discussion of all SJVAPCD's air quality attainment plans). In addition, as described in Impact 3.2-1 (in Table 3.2-4), estimated emissions of ozone precursors associated with project construction activities would not exceed the SJVAPCD-recommended annual mass emission thresholds of significance. However, construction-generated $NO_X$ emissions under one construction scenario did exceed the SJVAPCD daily mass screening criteria; thus, implementation of Mitigation Measure 3.2-1 for the proposed project would be required to reduce emissions to a less-than-significant level. The proposed project would also not generate new vehicle trips or require a level of ground disturbance that would produce operational emissions that could contribute to a violation of an air quality standard. Therefore, because construction-related emissions would not result in a violation of an ambient air quality standard and the proposed project would not result in any new operations-related emissions, the contribution of short-term construction and long-term operational emissions of criteria air pollutants by the project **would not result in a considerable contribution to the existing significant cumulative impact** related to air quality. No additional mitigation, beyond that suggested in Section 3.2, "Air Quality," is necessary to further minimize the proposed project's contribution to cumulative impacts on air quality.

As discussed under Impact 3.2-3, the proposed project would not result in significant health risks associated with toxic air contaminants because it would not expose any single receptor to a level of cancer risk that exceeds an incremental increase of 10 in one million, or to a noncarcinogenic hazard Index of 1. Therefore, the increases in health risk attributable to the project **would not result in a considerable contribution to a significant cumulative impact** related to toxic air contaminants.

## 4.4.2 Terrestrial Biological Resources

The cumulative context for biological resources impacts for this project is the area included in the *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan* (SJMSCP) plan area because this area supports all of the special-status species and habitats that could potentially be affected by implementation of the proposed project, contains known and major populations of many of these species, and contains important occupied and potential habitat for these species. The City of Lathrop is a signatory to the SJMSCP. The SJMSCP area includes the entirety of San Joaquin County, which is 912,640 acres.

Past development in the plan area, ranging from conversion of natural land to agricultural production more than a hundred years ago to recent expansion of urban development, has resulted in a substantial loss of native habitat to other uses. This land conversion has benefited a few species, such as those adapted to agricultural uses, but the overall effect on native plants, animals, and habitat has been decidedly negative. Future development could also result in the loss of habitat and special-status species further contributing to the existing significant cumulative impact on these resources. As described in Section 3.3, "Terrestrial Biological Resources," implementation of the proposed project could result in potentially significant impacts on valley elderberry longhorn beetle (Impact 3.3-1); western pond turtle (Impact 3.3-2); Swainson's hawk, white-tailed kite, Cooper's hawk, sharp-shinned hawk and other nesting raptors (Impact 3.3-3); loggerhead shrike, California horned lark, and other nesting birds (Impact 3.3-5); and riparian brush rabbit (Impact 3.3-6). However, these potential impacts would be mitigated to a less-than-significant level with implementation of the mitigation measures described in Section 3.3, "Terrestrial Biological Resources," which include seeking coverage under the SJMSCP. Therefore, the project would not contribute considerably to the existing significant cumulative impact on special-status species in the region. Similarly, impacts on sensitive habitats (i.e., state and federally protected wetlands and waters, and riparian habitat) under the proposed project would be reduced through identification, avoidance, and project-specific compensation and permitting requirements through appropriate regulatory agencies (e.g., Section 404 permit, Section 401 certification, Fish and Game Code Section 1602 authorization). As a result, and through implementation of mitigation identified in Section 3.3, "Terrestrial Biological Resources," the proposed project would not contribute considerably to the existing significant cumulative impact on sensitive habitat in the region.

In summary, cumulative development could result in potentially significant biological resource impacts. However, with implementation of mitigation measures, the proposed project's contribution to these impacts would be reduced to a less-than-significant level and the impact would not be considerable. Therefore, while the overall cumulative condition is adverse, the project **would not result in a considerable contribution to the existing significant cumulative**

**impact** related to terrestrial biological resources. No additional mitigation, beyond that provided in Section 3.3, "Terrestrial Biological Resources," is necessary to reduce the proposed project's contribution to cumulative impacts on terrestrial biological resources.

## 4.4.3 Aquatic Biological Resources

The geographic scope for the analysis of cumulative impacts for aquatic biological resources is the San Joaquin River basin, which drains to the San Joaquin River. Land uses within the watershed result in runoff into the rivers and reservoirs ultimately affecting river water quality. Past projects of dam and reservoir construction, water diversions, agricultural practices, urban development, levee construction for flood control, and related activities have resulted in the San Joaquin River's existing condition – both in terms of its water quality and physical habitat.

This assessment of cumulative impacts on fish and other aquatic biological resources is based on a set of assumptions about future cumulative adverse conditions affecting sensitive species and their habitat in the lower San Joaquin River and Sacramento–San Joaquin Delta (Delta) channel areas in the vicinity of the CTF effluent discharge, as influenced by the past, present, and reasonably foreseeable future projects including the effects of the proposed project. The combined effects on aquatic biological resources from projects and actions considered under the future cumulative condition would vary, ranging from the potential for additional adverse effects, to improvements associated with the many regulatory and habitat restoration programs that have been implemented in the past decade for recovery of impaired aquatic resource conditions. Key factors that would affect future aquatic habitat conditions in the project area include the following:

- urban development and growth in the CTF service area (Tables 4-3 through 4-5) and related potentially adverse effects associated with additional loss of habitats and buffer areas and urban storm water contaminant runoff;
- potential habitat restoration and population increases for Central Valley steelhead, San Joaquin River fall-run Chinook salmon, and reintroduction of spring-run Chinook salmon resulting from the San Joaquin River Restoration Program;
- systemwide hydrologic and water quality changes as affected by municipal water supply diversions, state and federal water supply and reservoir operations, and implementation of the California Department of Water Resources' Delta Conveyance Project; and
- changes in Delta hydrology, water quality, and habitat characteristics associated with climate change and sea-level rise.

Numerous past and present environmental stressors exist in the San Joaquin River and Delta for fishes and other aquatic resources, such that population levels for several anadromous fish species (e.g., Chinook salmon, steelhead, green sturgeon) and resident pelagic fish species (e.g., Delta smelt) are adversely affected presently, relative to their historic population levels. Potential environmental stressors to fish resources in the lower San Joaquin River and Delta depend on the species and life-stage of concern, and include, but may not be limited to, impaired habitat conditions (including the critical habitat in freshwater and ocean areas), food supply, hydrology and water quality, entrainment in diversions, predators, and invasive species. With the exception of intermittent years, escapement rates for native fall-run of Chinook salmon in the Stanislaus River (i.e., number of fish returning to natal freshwater habitat to spawn in the principal San Joaquin River tributary where Chinook salmon monitoring data are available) have generally been lower in the past 20 years compared to prior runs (Reclamation 2008). With respect to the Central Valley Project Improvement Act goal of doubling the anadromous fish populations, the Stanislaus River fall-run Chinook salmon population is designated as being in a state of "not rebuilding," and thus indicating no improvement or substantial further decline of the population (Reclamation 2008). Fish hatchery production provides some assistance to achieve population goals for anadromous fish in the San Joaquin River system, including the Mokelumne River hatchery (i.e., for fall-run Chinook salmon and steelhead) and Merced River hatchery (i.e., fall-run Chinook salmon). With respect to the Delta smelt population in the Delta, the Pelagic Organism Decline (POD) phenomenon of the four primary pelagic fish species of the Delta (i.e., Delta smelt, longfin smelt, striped bass, and threadfin shad) has severely depressed pelagic species population levels since about 2000. The reasons for POD are uncertain but appear to be associated with habitat, invasive species, prior-year abundance of each species, food and prey relationships, and some water quality parameters (e.g., turbidity, contaminants) (Baxter et al. 2008). Temperature has not been indicated as a substantial factor to POD.

Multiple restoration actions are underway or have been planned for the Central Valley to improve fish habitat and increase fish populations, for federal Endangered Species Act–listed species in particular, including the Anadromous Fisheries Restoration Program and the San Joaquin River Restoration Program. The U.S. Bureau of Reclamation has been implementing measures for the Central Valley Project (CVP) system including, but not limited to, improved reservoir cold water pool management procedures, use of temperature control devices, and development of revised instream flow standards. Additionally, the U.S. Fish and Wildlife Service issued a biological opinion (BO) in 2008, and National Marine Fisheries Service (NMFS) issued a BO in 2009, for the Operations and Coordinated Actions Plan (OCAP) for the CVP/State Water Project (SWP) water supply operations in the Central Valley and Delta. The Reasonable and Prudent Alternatives of the OCAP BOs include actions for species recovery including modifications of CVP/SWP water supply operations (e.g., export pumping restrictions, Delta Cross Channel operational periods, limitations on reverse flow conditions in south Delta channels), additional flow requirements for the Stanislaus River and lower San Joaquin River, modified Shasta Reservoir storage targets to achieve water temperature requirements in the Sacramento River, and modified lower American River flow standards. The San Joaquin River Restoration Program has the goal of restoring and maintaining anadromous fish populations in "good condition" in the main stem San Joaquin River below Friant Dam to the confluence of the Merced River through the release of up to an additional 840,000 acre-feet of water annually to the mainstem San Joaquin River and includes many fish passage improvements for the channel (San Joaquin River Restoration Program 2011). Finally, extensive habitat restoration actions would be anticipated to occur in association with the California Department of Water Resources' Delta Conveyance Project implementation over the next 20 years for protection and enhancement of anadromous and resident species in the Delta.

Collectively, restoration actions and modifications to water supply operations would reduce some of the uncertainty regarding future adverse cumulative effects on fish populations and their prey organisms. While the aforementioned restoration and regulatory compliance actions are intended to improve and restore salmonid and native fish populations, the success of the actions in terms of future conditions is uncertain. Accordingly, the OCAP BOs concluded that the continued CVP/SWP operations potentially jeopardize the recovery and survival of Delta smelt and Central Valley steelhead.

Based on available information, it is clear that both positive (e.g., habitat restoration) and negative (e.g., human population growth, increased water diversions, increased urban runoff, climate change and sea-level rise) factors would occur in the future. As such, it remains unclear whether the future cumulative condition for aquatic biological resources in the lower reach of the San Joaquin River would further decline or improve, relative to existing conditions. In reality, the river is likely to experience both improvements and declines over time, depending upon the specific aquatic species and/or habitat factor considered.

Potential future changes to seasonal or long-term trends in water temperature in the lower San Joaquin River or the Delta that may occur in association with implementation of the Reasonable and Prudent Alternatives for the OCAP BOs, Delta Conveyance, other restoration actions, and climate change remain uncertain. Temperature modeling for the upper San Joaquin River for the NMFS BO for the San Joaquin River Restoration Program indicated that temperature conditions would not be appreciably affected by the additional reservoir water releases for restoration purposes (NMFS 2012). Nevertheless, in general, future climate change is expected to warm Central Valley rivers, including the San Joaquin River. Consequently, the future cumulative condition for temperature in the lower reach of the San Joaquin River is considered to be a significant adverse cumulative condition, relative to existing conditions. The cumulative temperature assessments below thus address whether the project's contribution to the future cumulatively significant temperature condition is considerable and, therefore, significant.

As described and assessed in Section 3.4, "Aquatic Biological Resources," and Section 3.9, "Hydrology and Water Quality," in this Draft EIR, project construction-related effects on river water quality and habitat conditions would be both small in magnitude and temporary in nature. Consequently, no significant construction-related impacts on water quality or physical aquatic habitat in the San Joaquin River and Delta would occur, including habitat located within designated critical habitat for a special-status species. Therefore, there would be no lasting construction-related impacts from the project on aquatic resources in the affected environment that would cumulatively combine with other impacts on these same resources. Therefore, project construction **would not result in a considerable contribution to the existing significant cumulative impact** related to habitat for aquatic biological resources.

As described and assessed in Section 4.4.8, "Hydrology and Water Quality," below, the project would not result in a considerable contribution to an existing significant cumulative impact related to San Joaquin River water quality. The "Water Quality" subsection includes a cumulative analysis of all water quality parameters affected by the proposed project, and assessed their potential to impact beneficial uses, including aquatic life uses, other than temperature, which is assessed in this section, below.

Because the temperature of the effluent discharged from the CTF as part of the project would generally be higher than background San Joaquin River water temperatures, this assessment evaluates whether the project's incremental increases to the seasonal temperatures of the lower reach of the San Joaquin River (upon effluent fully mixing with river flows) in the future when the CTF is discharging at a rate of 6.0 mgd average dry weather flow (ADWF) would cause a cumulatively significant impact. This was evaluated in detail in Section 3.2 of Appendix E, "Aquatic Biological Resources Thermal Assessment for the City of Lathrop Consolidated Treatment Facility Surface Water Discharge Project." Project-specific incremental increases in river temperature of small magnitudes (i.e., maximum ≤0.6°F and typically ≤0.3°F on a daily average basis) and the resulting fully mixed river temperatures at the CTF outfall (where the incremental effects would be the greatest) would not cause lethality or any chronic, adverse impacts on fish, phytoplankton, zooplankton, invertebrates, or other aquatic resources in the lower river in the vicinity of the CTF. Moreover, project-driven incremental temperature changes would not block or delay fish movements or migrations through the project reach of the river. Based on these findings, the incremental contribution of the project to fully mixed lower San Joaquin River water temperatures **would not result in a considerable contribution to the existing significant cumulative impact** related to river temperature condition and its effect on aquatic biological resources.

Regarding the thermal plume that would exist in the immediate vicinity of the CTF outfall (see Section 3.3 in Appendix E), prior to effluent fully mixing with river flows, the overall size and shape of the plume within the channel would not block or delay any fish movement past the outfall. This is the case, in part, because ample zones of passage within the river channel that are unaffected or minimally affected thermally by the plume would always exist under all effluent and river flow and temperature conditions. Moreover, the thermal plume would not be lethal to or cause any chronic, adverse, sublethal effects on fish, phytoplankton, zooplankton, or benthic macroinvertebrates swimming or drifting through any portion of the plume. Because most fish and other aquatic life would never be exposed to the thermal plume due to the presence of large zones of passage in the central and western portion of the channel and along the river bottom, and because those that would encounter the plume would pass through its warmest area within seconds, the existence of the thermal plume and its negligible effect on aquatic resources would not cumulatively combine with other impacts or stressors to these same resources. Therefore, the presence of a thermal plume associated with the proposed project **would not result in a considerable contribution to the existing significant cumulative impact** related to river temperature condition and its effect on aquatic biological resources.

## 4.4.4 Cultural, Tribal Cultural, and Paleontological Resources

The project site is underlain by geologically immature flood basin (Qb) and river (Qr) deposits which are considered to have a low potential for paleontological resources. The low sensitivity of these Holocene deposits is known to extend to considerable depths, up to 20,000 feet. Therefore, the likelihood of past development encountering paleontological resources is low and there is no existing significant cumulative impact related to paleontological resources. The proposed project-related construction is not likely to expose paleontological resources, and therefore **would not result in a considerable contribution to a significant cumulative impact**.

The geographic scope for the analysis of cumulative impacts on archaeological resources, tribal cultural resources (TCRs), and human remains is the historic lands of the Northern Valley Yokuts, whose core lands were along the San Joaquin River, extending from north of the Calaveras River southward to the upper San Joaquin River, and from the crest of the Coast (Diablo) Range east to the Sierra Nevada foothills.

Because all significant cultural resources are unique and nonrenewable members of finite classes, meaning there are a limited number of significant cultural resources, all adverse effects erode a dwindling resource base. The loss of any one archaeological site could affect the scientific value of others in a region because these resources are best understood in the context of the entirety of the cultural system of which they are a part. The cultural system is represented archaeologically by the total inventory of all sites and other cultural remains in the region. As a result, a meaningful approach to preserving and managing cultural resources must focus on the likely distribution of cultural resources, rather than on a single project or parcel boundary.

The historic lands of the Northern Valley Yokuts people have been affected by development since the arrival of the first Spanish settlers. By 1805, sizeable numbers of Northern Valley Yokuts had been transported to missions established during the Spanish era. The gold prospectors, farmers, and railroad development of the early American Period later displaced many remaining native populations. These activities have resulted in an existing significant adverse effect on archaeological resources, TCRs, and human remains. Cumulative development, including probable future projects listed in Tables 4-3, 4-4, and 4-5, continues to contribute to the disturbance of cultural resources.

No known unique archaeological resources, TCRs, or human remains are located within the boundaries of the project site; nonetheless, project-related earth-disturbing activities could damage undiscovered archaeological resources, TCRs or human remains. The proposed project, in combination with other cumulative projects in the region, could contribute to ongoing substantial adverse changes in the significance of unique archaeological resources resulting from urban development and conversion of natural lands. Cumulative development could result in potentially significant archaeological resource impacts.

Implementation of Mitigation Measures 3.5-1 and 3.5-2 would ensure that the proposed project’s contribution to cumulatively significant archaeological resource and TCR impacts would not be considerable by requiring construction work to cease in the event of an accidental find and the appropriate treatment of discovered resources, in accordance with pertinent laws and regulations. With implementation of these mitigation measures, the proposed project’s contribution to these impacts would be reduce or avoided. Further, cumulative development would be required to implement similar mitigation to avoid or reduce impacts on archaeological resources and TCRs. Compliance with California Health and Safety Code Sections 7050.5 and 7052 and PRC Section 5097 as required by Mitigation Measure 3.5-3 would ensure that treatment and disposition of the remains occurs in a manner consistent with state guidelines and California Native American Heritage Commission guidance. Therefore, the proposed project **would not result in a considerable contribution to the existing significant cumulative impact** related to archaeological resources, TCRs, or human remains. No additional mitigation, beyond that suggested in Section 3.5, “Cultural, Tribal Cultural, and Paleontological Resources,” is necessary to reduce the proposed project’s contribution to cumulative impacts on archaeological resources, TCRs, or human remains.

## 4.4.5 Energy

The proposed project would not introduce new sources of operational energy demand; thus, the proposed project would not result in any operational use of energy that would combine with other cumulative projects or future development in the PG&E service area to result in a cumulative impact related to wasteful or inefficient use of energy. As described in Impact 3.6-1 in Section 3.6, “Energy,” of this Draft EIR, the one-time energy expenditure required to construct the proposed project would be nonrecoverable; there is no atypical construction-related energy demand; and nonrenewable energy would not be consumed in a wasteful, inefficient, or unnecessary manner when compared to other construction activity in the region. Moreover, this one-time energy expenditure would facilitate the proposed project’s objectives to provide for effluent discharge to the San Joaquin River to support planned growth in the City, provide efficient and cost-effective wastewater services to the City, and maximize the use of recycled water in the City. Therefore, construction energy consumption would not be wasteful, inefficient, or unnecessary. The project’s contribution to gasoline and diesel fuel use **would not result in a considerable contribution to a significant cumulative impact** related to energy resources.

## 4.4.6 Greenhouse Gas Emissions and Climate Change

Section 3.7, "Greenhouse Gas Emissions and Climate Change," contains the cumulative global climate change analysis. It provides estimates and analyzes the greenhouse gas (GHG) emissions associated with project-related construction activities and operation of the CTF. The potential effects of global climate change on the project are also identified based on available scientific data.

As reported in Section 3.7, "Greenhouse Gas Emissions and Climate Change," the proposed project's GHG emissions would be 8,502 metric tons of carbon dioxide equivalent ($MTCO_2e$) per year. Because the proposed project's GHG emissions would be below the applicable threshold of 10,000 $MTCO_2e$ per year that was applied to the project, the proposed project **would not result in a considerable contribution to a cumulatively significant impact** related to GHG emissions and global climate change.

## 4.4.7 Hazards and Hazardous Materials

Although some hazardous materials releases can cover a large area and interact with other releases (e.g., atmospheric contamination, contamination of groundwater aquifers), incidents of hazardous materials contamination are more typically isolated to a small geographic area. These relatively isolated areas of contamination typically do not combine in a cumulative manner with other sites of hazardous materials contamination. On the project site and in its vicinity, there are no identified incidents of widespread hazardous materials contamination with different sources of contamination interacting on a cumulative basis, including for previously undocumented hazardous wastes that could be encountered during construction activities. Future projects that would include construction activities and add new residences, commercial uses, and infrastructure (see Tables 4-3 through 4-5) may use, store, and generate hazardous materials; however, the proposed project and these cumulative projects would be subject to existing federal, state, and local hazardous materials regulations, limiting the potential for releases and contamination and requiring clean-up when such events occurred. Given these conditions, the proposed project **would not result in a considerable contribution to a significant cumulative impact** related to hazardous materials.

The geographic area for cumulative impacts related to emergency evacuation would be the areas directly adjacent to the project site where pipeline construction would occur along Tesla Way, Harlan Road, and Inland Passage Way.

Cumulative projects in Tables 4-3 through 4-5 that could combine with the proposed project to potentially result in impacts on emergency access could include Mossdale South Neighborhood Park Improvements, Sadler Oak Transmission Improvement Project, and Crossroads Gravity Main Replacement Project. In the event of an emergency, evacuation from these areas would occur via local roads to I-5. While conditions on local roadways and I-5 during an emergency evacuation could be congested, no known element of the proposed project or cumulative projects would prevent or impede evacuation, or result in physical interference with an evacuation plan such that evacuation could not occur. Construction of the proposed project and cumulative projects could result in temporary, short-term limitations on roadways if portions of roadways would be obstructed during construction. As described under Section 2.7.3, "Construction Methods and Labor Force," in Chapter 2, "Project Description," the construction contractor would prepare and implement a traffic control plan that would identify measures to continue to provide access to adjacent land uses (e.g., residences, industrial) and maintain emergency access. Like the proposed project, the cumulative projects would be required to implement a traffic control plan to minimize interference with traffic and emergency response. Therefore, the project **would not result in a considerable contribution to a significant cumulative impact** related to emergency access or implementation of an emergency evacuation plan.

## 4.4.8 Hydrology and Water Quality

With regards to groundwater, the City of Lathrop and the project site are located within the Tracy Subbasin, which lies within the San Joaquin Valley Basin. The basin has not been designated by the California Department of Water Resources as being in a critical overdraft condition. Most of the municipal and industrial wells in the Lathrop area penetrate through the upper Victor formation into the deeper Laguna formation (EKI 2019a).

The CTF currently discharges effluent to 276 acres of land application areas (LAAs) located in the northern, central, and western portions of the City. With implementation of the proposed project, effluent would no longer be discharged to these areas. Currently, effluent that is applied to the LAAs is done so at rates that do not exceed the agronomic rates for the crops grown. Thus, while the project would eliminate land application of effluent is some areas, the effluent that is applied to these LAAs is not at a rate that contributes significantly to groundwater recharge. Further, most of the municipal and industrial wells in the Lathrop area withdraw water from the deeper Laguna formation, which would not be affected by the discharge of effluent to land. Thus, the proposed project would not decrease groundwater supplies or interfere substantially with groundwater recharge in the future. Thus, the proposed project would not combine with other cumulative projects to adversely affect groundwater recharge.

The City of Lathrop formed its own groundwater sustainability agency for the portion of its groundwater subbasin jurisdiction located east of the San Joaquin River. The portion of the City overlaying the subbasin west of the San Joaquin River is managed by the Stewart Tract Groundwater Sustainability Agency. In total, there are seven groundwater sustainability agencies cooperating to develop a Groundwater Sustainability Plan for the Tracy Subbasin that is to be completed and approved by January 31, 2022. This level of monitoring and management of the Tracy Subbasin, which is not over-drafted presently, is expected to maintain the subbasin in a sustainable condition in the future, despite planned urban growth (Table 4-2). Consequently, the cumulative effects of development in the region to groundwater resources without the proposed project would not result in significant cumulative impact. The project's effects on groundwater would not be substantial enough, when combined with the effects from other cumulative projects, to result in a significant cumulative impact. For the reasons described herein, the proposed project **would not result in a considerable contribution to a significant cumulative impact** related to groundwater supply or groundwater recharge.

The San Joaquin River and Delta channels that are contained by levees, such as existing levees surround the CTF site. These levees may be subject to forces over time that potentially increase the risk of flood hazards on upland urban areas and farmlands. Such forces include long-term channel erosion and levee instability, seismic ground shaking, and climate change with associated hydrologic changes in the upper watershed and sea-level rise that may lead to more frequent high flow events or overtopping of levees. Therefore, the lower San Joaquin River and nearby Delta channels may be exposed to future cumulative potentially significant hydrologic impacts. However, the CTF discharge at 6.0 mgd ADWF reflects a nearly immeasurable amount of flow in the San Joaquin River (i.e., averages 0.5-1.9 percent of river flow, depending upon the month), particularly during peak river flow events. Thus, implementation of the proposed project would not **result in a considerable contribution to the existing significant cumulative impact** related to hydrology and flooding.

Based on future population growth in the region, associated changes in land uses, and climate change and sea-level rise, lower San Joaquin River and Delta water quality would likely be maintained and possibly even improved for some constituents and degraded for others. Consequently, a single determination for whether past, present, and reasonably foreseeable projects and projected population growth would result in a cumulatively significant impact on water quality is not possible. Rather, individual constituents and constituent groups need to be specifically evaluated.

The reach of the San Joaquin River at the proposed CTF discharge location is within the legal boundary of the Delta. Delta waterways are currently impaired (i.e., do not comply with water quality criteria/objectives) for chlorpyrifos, dichlorodiphenyltrichloroethane (DDT), diazinon, electrical conductivity (EC) (south Delta only), various "Group A" organochlorine pesticides, mercury, and unknown toxicity. Although some of these impairments may be removed from the 303(d) list in the future, such as chlorpyrifos and diazinon because of continued reductions in use over time, others such as legacy Group A pesticides, DDT, mercury, EC, and unknown toxicity are expected to persist for the future cumulative condition. As such, river and Delta levels for these latter constituents are expected to maintain impairments and thus would likely constitute a significant adverse future cumulative water quality condition.

The CTF effluent does not typically contain chlorpyrifos, DDT, diazinon, or organochlorine pesticides because these pesticides have been banned for urban uses. With regards to mercury, the San Joaquin River's average mercury concentration is 4.9 ng/L, whereas the CTF effluent's average and maximum concentrations are 0.62 ng/L and 3.6 ng/L, respectively. Consequently, project discharges would not increase mercury concentrations in the San Joaquin River and the project's annual loading to Delta waters would be negligible compared to the annual mercury loadings to the Delta from the San Joaquin and Sacramento rivers. Regarding toxicity, the CTF's undiluted tertiary treated effluent is not expected to cause toxicity to aquatic life, and thus would not contribute to or cumulatively combine with other sources of unknown toxicity in the river or elsewhere in the Delta. Based on these findings, the proposed project **would not result in a considerable contribution to a cumulative impact** related to cumulative conditions for chlorpyrifos, DDT, diazinon, various "Group A" organochlorine pesticides, mercury, and unknown toxicity in Delta waters. Project contributions to river and Delta EC levels are discussed below.

As described in Section 3.9, "Hydrology and Water Quality," construction of the proposed project would involve the storage, transport, handling, and use of a variety of hazardous substances and non-hazardous materials. Implementation of the erosion control and stormwater pollution prevention best management practices, which includes obtaining coverage under the State Water Resources Control Board's National Pollutant Discharge Elimination System (NPDES) Construction General Permit (Order No. 2009-0009-DWQ/NPDES Permit No. CAS000002, and any applicable amendments) and development of a stormwater pollution prevention plan, would minimize and avoid many of the potential temporary construction-related water quality effects of the project. Hence, project construction's incremental contributions to any cumulatively significant water quality condition in the San Joaquin River or downstream Delta waters would not be considerable, nor would construction-related effects make an otherwise non-significant cumulative water quality condition significant.

As described in Section 3.9, "Hydrology and Water Quality," and Appendix F, "Antidegradation Analysis for the Proposed Consolidated Treatment Facility Discharge to the San Joaquin River," the operation of the proposed project in the future would result in discharge of up to 6.0 mgd ADWF of tertiary treated effluent into the San Joaquin River. The City of Manteca has no current plans to expand its Water Quality Control Facility (WQCF) because current flows of about 6.6 mgd ADWF are well below the permitted treatment capacity of the WQCF, which is 9.87 mgd ADWF. Manteca is presently evaluating whether it would convey its WQCF effluent to the Delta-Mendota Canal near Tracy, California, rather than continue to discharge the effluent into the San Joaquin River. This project is scheduled to be implemented within the next few years, if determined to be feasible. Should that project be implemented, Manteca's existing constituent loading to the San Joaquin River upstream of the proposed CTF outfall location, at a present discharge rate of approximately 6.6 mgd ADWF, would cease. Although Manteca's present discharge is not believed to be causing significant adverse impacts on river water quality, the ceasing of the discharge would result in small reductions in some water quality constituent concentrations downstream of the discharge.

Effluent discharged from the CTF at a rate of up to 6.0 mgd ADWF in the future would have constituent concentrations lower than applicable federal water quality criteria and state water quality objectives, except for barium, EC, and trihalomethanes. Neither effluent barium nor effluent EC concentrations would cause river water to exceed Basin Plan and Bay-Delta Plan objectives, respectively, for these constituents upon discharged effluent initially mixing with San Joaquin River water (Appendix F). There would be even less effect of the CTF discharge at Bay-Delta Plan southern Delta EC compliance locations and the discharge would not cause exceedance of EC objectives at these Bay-Delta Plan compliance locations. As such, project discharges would not contribute considerably to future Delta EC levels.

The proposed project would result in the discharge of trihalomethanes (i.e., bromoform, chlorodibromomethane [CDBM], chloroform, and dichlorobromomethane [DCBM]) to the San Joaquin River. There are no regulatory criteria for chloroform. Concentrations of bromoform, CDBM, and DCBM in the undiluted CTF discharge would be greater than applicable California Toxics Rule (CTR) criteria. However, long-term average concentrations in the San Joaquin River would be less than CTR criteria in areas that could potentially be used for municipal supply, which is the beneficial use of concern for these compounds. Also, these compounds are volatile, and thus ultimately volatilize to non-detectable levels in the river. Measurable trihalomethane levels for a distance downstream of the CTF outfall would not cumulatively combine with other sources of trihalomethanes, because there are none, and would not result in adverse effects on any beneficial uses.

The project contributions of nitrate and phosphorus to the San Joaquin River under the future 6.0 mgd ADWF discharge conditions would not contribute to adverse biostimulatory conditions in the river or downstream Delta waters. Algal primary productivity is relatively low in the Delta and algae are not limited by nutrient levels. Rather, nutrients are in abundance to meet the nutritional requirements of primary producers. Thus, small changes in Delta nutrient concentrations due to the proposed project would not substantially affect primary productivity. The same is true for harmful cyanobacteria algal blooms and macrophyte communities in Delta waters.

Future project discharges at 6.0 mgd ADWF would have no adverse effects on river pH, turbidity, or dissolved oxygen levels. Cumulative project effects on San Joaquin River water temperatures are assessed in Section 4.4.3, "Aquatic Biological Resources," above.

Under future cumulative conditions, the proposed project would not make any 303(d) listings discernably worse. In addition, the minor water quality degradation that project discharges would cause to various constituents would not result in any new 303(d) listings nor would such degradation exceed available assimilative capacity of the river or result in water quality levels that would pose risks of adverse effects on designated beneficial uses of the river or Delta. Future cumulative contributions of all water quality constituents to the San Joaquin River evaluated herein, as supported by Appendix F, **would not result in a considerable contribution to the existing significant cumulative impact** related to any significant cumulative water quality condition in the San Joaquin River or downstream Delta waters, nor would project discharges make an otherwise non-significant cumulative water quality condition significant for any constituent.

## 4.4.9 Noise and Vibration

As discussed in Section 3.10, "Noise and Vibration," implementation of the proposed project would generate noise and vibration levels above existing conditions. However, project construction would occur during the less sensitive times of the day from 7 a.m. to 5 p.m. on weekdays, pursuant to Section 8.2.110 of the City of Lathrop Municipal Code and consistent with Mitigation Measure 4.6-1 from the 2001 EIR for the Lathrop Water, Wastewater, and Recycled Water Master Plan (City of Lathrop 2001:4.6-10 to 4.6-11), incorporated by reference in the *City of Lathrop Consolidated Treatment Facility Project Initial Study/Mitigated Negative Declaration* (City of Lathrop 2013). Thus, project-level construction noise impacts would be less than significant. Similarly, construction-related vibration would not result in damage to sensitive structures or disturbance to people, and therefore, would result in a less-than-significant impact. No adverse construction noise or vibration conditions currently exist in the project site.

Noise and vibration are localized issues in that they attenuate with increasing distance from the source. Therefore, only reasonably foreseeable future development projects in the direct vicinity of the project site would have the potential to add to anticipated project-generated noise and vibration and result in a cumulative noise or vibration impact. Based on the projects identified within the cumulative list for this project in Section 4.3, "Cumulative Setting," above, the only project that has the potential to be constructed during the same general timeframe as the proposed project is the WD-9 Sadler Oak Transmission Improvement Project. This project would upsize an existing pipeline along Sadler Oak Road from Inland Passage Way to Manthey Road, which would require excavation and pipeline installation. This type of construction is linear in nature, involving few pieces of equipment moving along the right-of-way and not generating substantial noise at any one location for extended periods of time. This type of work is similar in nature to construction of the effluent discharge pipeline for the proposed project. Due to the similar nature in construction activities between the two projects, it is likely that equipment types and associated noise levels would be similar (i.e., up to 85.6 decibel [dB] $L_{eq}$ and 91.5 dB $L_{max}$ at 50 feet). Although it is unlikely that both construction projects would occur at the same distance from the same receptor such that noise levels from each construction site would combine to result in a 3-dB increase at that receptor (i.e., a doubling of a noise source results in a 3-dB increase), it is conservatively assumed that this scenario could occur for some period of time if construction of both projects were to overlap. Under this scenario, the proposed project's contribution to this combined noise level would represent an increase of 3 dB, which is barely perceptible to the human ear (Caltrans 2013:2-45). Because of the temporary and linear nature of both projects, this scenario would likely only occur for very limited periods of time during the day, if at all. Further, construction activities for the proposed project and the WD-9 Sadler Oak Transmission Improvement Project would occur during the daytime when people are less sensitive to noise. Given the temporary nature of construction activities, the fact that all construction would occur during the less sensitive times of the day, and the unlikely occurrence and unsubstantial effect of both projects' construction noise combining to affect the same receptors, project-generated construction noise **would not result in a considerable contribution to a significant cumulative impact** related to construction noise.

Construction-related vibration impacts would not occur beyond 40 feet, and thus, would be localized to the project site and would not combine with vibration from other nearby construction activities. Therefore, project-generated vibration would not combine with other foreseeable construction activities and **would not result in a considerable contribution to a significant cumulative impact** related to vibration.

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# 5 ALTERNATIVES

## 5.1 INTRODUCTION

CCR Section 15126.6(a) (State CEQA Guidelines) requires EIRs to describe:

> a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.

This section of the State CEQA Guidelines also provides guidance regarding what the alternatives analysis should consider. Subsection (b) further states that the purpose of the alternatives analysis is as follows:

> Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

The State CEQA Guidelines require that the EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project as proposed (CCR Section 15126.6[d]).

The State CEQA Guidelines further require that the "no project" alternative be considered (CCR Section 15126.6[e]). The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving a proposed project with the impacts of not approving the proposed project. If the no project alternative is the environmentally superior alternative, CEQA requires that the EIR "shall also identify an environmentally superior alternative among the other alternatives" (CCR Section 15126[e][2]).

In defining "feasibility" (e.g., "feasibly attain most of the basic objectives of the project"), CCR Section 15126.6(f)(1) states, in part:

> Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.

In determining what alternatives should be considered in the EIR, it is important to consider the objectives of the project, the project's significant effects, and unique project considerations. These factors are crucial to the development of alternatives that meet the criteria specified in Section 15126.6(a). Although, as noted above, EIRs must contain a discussion of "potentially feasible" alternatives, the ultimate determination as to whether an alternative is feasible or infeasible is made by the lead agency's decision-making body, here the City Council. (See PRC Sections 21081.5, 21081[a][3].)

# 5.2 CONSIDERATIONS FOR SELECTION OF ALTERNATIVES

## 5.2.1 Attainment of Project Objectives

As described above, one factor that must be considered in selection of alternatives is the ability of a specific alternative to attain most of the basic objectives of the project (CCR Section 15126.6[a]). In accordance with the State CEQA Guidelines (CCR Section 15124[b]), the proposed project has the following objectives:

- Provide for planned City buildout and development based on the City's General Plan by providing effluent discharge to the San Joaquin River.
- Provide efficient and cost-effective wastewater services through buildout of the City.
- Maximize use of recycled water in the City presently and in the future.

The discussion of alternatives below describes whether or not each alternative could accomplish these basic project objectives.

## 5.2.2 Environmental Impacts of the Lathrop Consolidated Treatment Facility Surface Water Discharge Project

Sections 3.1 through 3.10 of this Draft EIR address the environmental impacts of implementation of the proposed project. Potentially feasible alternatives were developed with consideration of avoiding or lessening the significant, and potentially significant, adverse impacts of the project, as identified in Chapter 3 of this Draft EIR and summarized below. If an environmental issue area analyzed in this Draft EIR is not addressed below, it is because no significant or potentially significant impacts were identified for that issue area. Implementation of the proposed project would not result in any significant and unavoidable impacts.

As identified in Table ES-1, "Summary of Environmental Effects of the Alternatives Relative to the Proposed Project," presented below in Section 5.5, construction and/or operation of the proposed project would have the potential to cause the following significant <u>but mitigable</u> environmental impacts. After mitigation, none of the impacts would remain significant:

### AIR QUALITY

- Impact 3.2-1: Result in Short-Term Emissions of Criteria Air Pollutants and Precursors

### TERRESTRIAL BIOLOGICAL RESOURCES

- Impact 3.3-1: Cause Disturbance to or Loss of Valley Elderberry Longhorn Beetle
- Impact 3.3-2: Cause Disturbance to or Loss of Western Pond Turtle
- Impact 3.3-3: Cause Disturbance to or Loss of Swainson's Hawk, White-Tailed Kite, Cooper's Hawk, Sharp-Shinned Hawk, and Other Nesting Raptors
- Impact 3.3-4: Cause Disturbance to or Loss of Loggerhead Shrike, California Horned Lark, and Other Nesting Birds
- Impact 3.3-5: Cause Disturbance to or Loss of Riparian Brush Rabbit
- Impact 3.3-6: Cause Disturbance and Loss of Waters of the United States and State
- Impact 3.3-7: Cause Disturbance to or Loss of Riparian Habitat

## AQUATIC BIOLOGICAL RESOURCES

- Impact 3.4-2: Cause Direct Fish Injury or Mortality during Construction Resulting in Impacts on Fish Populations

## CULTURAL, TRIBAL CULTURAL, AND PALEONTOLOGICAL RESOURCES

- Impact 3.5-2: Cause a Substantial Adverse Change in the Significance of Archaeological Resources
- Impact 3.5-3: Cause a Substantial Adverse Change in the Significance of a Tribal Cultural Resource
- Impact 3.5-4: Disturb Human Remains

## HAZARDS AND HAZARDOUS MATERIALS

- Impact 3.8-1: Create a Significant Health Hazard from the Routine Transport, Use, or Disposal of Hazardous Materials, Including Reasonably Foreseeable Upset or Accidents

# 5.3 ALTERNATIVES CONSIDERED BUT NOT EVALUATED FURTHER

As described above, State CEQA Guidelines Section 15126.6(c) provides that the range of potential alternatives for the project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. Alternatives that fail to meet the fundamental project purpose need not be addressed in detail in an EIR (*In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* [2008] 43 Cal.4th 1143, 1165–1167).

In determining what alternatives should be considered in the EIR, it is important to acknowledge the objectives of the project, the project's significant effects, and unique project considerations. These factors are crucial to the development of alternatives that meet the criteria specified in Section 15126.6(a). Although, as noted above, EIRs must contain a discussion of "potentially feasible" alternatives, the ultimate determination as to whether an alternative is feasible or infeasible is made by lead agency decision makers, in this case the Lathrop City Council. (See PRC Section 21081[a][3].) At the time of action on the project, the City Council may consider evidence beyond that found in this EIR in addressing such determinations. The City Council, for example, may conclude that a particular alternative is infeasible (i.e., undesirable) from a policy standpoint and may reject an alternative on that basis provided that the decision maker(s) adopts a finding, supported by substantial evidence, to that effect, and provided that such a finding reflects a reasonable balancing of the relevant economic, environmental, social, and other considerations supported by substantial evidence (*City of Del Mar v. City of San Diego* [1982] 133 Cal.App.3d 401, 417; *California Native Plant Society v. City of Santa Cruz* [2009] 177 Cal.App.4th 957, 998).

The EIR should also identify any alternatives that were considered by the lead agency but were rejected during the planning or scoping process and briefly explain the reasons underlying the lead agency's determination.

The following alternatives were considered because they represent opportunities to redirect the disposal of treated effluent from storage ponds and agricultural land within the City boundaries and allow those lands to be used for urban uses as designated in the City's General Plan; thus, these alternatives would meet this objective of the project to provide for planned City buildout and development based on the City's General Plan.

The following alternatives were considered by the City but are not evaluated further in this Draft EIR.

## 5.3.1 Convert Manteca WQCF to a Regional Plant and Close Lathrop CTF Alternative

The Convert City of Manteca (Manteca) Water Quality Control Facility (WQCF) to a Regional Plant and Close Lathrop CTF Alternative would convey all wastewater flows from the CTF service area to the Manteca WQCF for treatment along with wastewater from the East Lathrop service area currently treated by the WQCF. The Lathrop

CTF would be decommissioned. This would be a regionalization opportunity that would result in the WQCF becoming a regional wastewater treatment facility and allow Lathrop's wastewater to be discharged to the San Joaquin River via Manteca's outfall pipeline. This alternative was analyzed in the *Evaluation of Wastewater Treatment Regionalization, Reclamation, Recycling, and Conservation for the City of Lathrop*, which is otherwise referred to as the Regionalization Report (RBI 2019).

The treatment capacity of the Manteca WQCF is vital to the feasibility of this alternative. The design treatment capacity of the Manteca WQCF is 9.87 mgd average dry weather flow (ADWF). Projected buildout influent flows are 6.69 mgd for Lathrop, which includes the 5.22 mgd for the CTF service area and 1.47 mgd from East Lathrop, and 23 mgd for Manteca, which totals 29.69 mgd. With implementation of this alternative, the buildout influent flows would be substantially greater than the Manteca WQCF's current treatment capacity. As identified in the Regionalization Report, the existing WQCF does not have sufficient capacity for projected combined Lathrop and Manteca buildout flows. Thus, to fully treat future buildout flows from both Lathrop and Manteca, expansion of the Manteca WQCF beyond its current treatment capacity would be needed. Manteca staff have stated that they have no current plans to expand the WQCF because current influent ADWF flows are 6.57 mgd, which are well below the current treatment capacity of 9.87 mgd (RBI 2019:25).

Based on the close proximity of the CTF to the Manteca WQCF, it is likely that the existing pipeline and pump station system for wastewater conveyance to the CTF could be used to convey wastewater from Lathrop west of I-5 to the Manteca WQCF. However, an additional 30-inch pipeline would need to be constructed to convey wastewater away from the CTF to the Manteca WQCF for treatment (1.7 miles). A 30-inch pipeline would provide sufficient capacity for projected peak hourly wastewater flows through buildout, based on a peak velocity of 7 feet per second through the pipeline (RBI 2019:24–31).

The existing Manteca WQCF outfall pipeline does not have sufficient capacity for projected buildout flows for both Lathrop and Manteca. The Regionalization Report estimated that an additional parallel outfall pipeline would need to be constructed to accommodate a regional Manteca WQCF buildout discharge flow rate to the San Joaquin River. Further, an additional outfall pump and construction of an outfall diffuser would be needed to convey buildout flows (RBI 2019:26).

Conveying all of Lathrop's wastewater to the Manteca WQCF introduces uncertainties regarding the ability of Lathrop to effectively manage its planned reuse efforts for landscape irrigation and thus, reduce its reliance on potable water supplies. For this alternative to be viable and not adversely impact future Lathrop water supplies, Manteca would have to agree to convey recycled water back to Lathrop in volumes equivalent to those planned for reuse and landscape irrigation. This alternative is not considered viable because it would put at risk Lathrop's ability to optimally manage its water supplies, particularly with regard to its recycled water reuse program (RBI 2019:27).

Based on discussions with City of Manteca staff, it is unlikely that the City of Manteca would be willing to provide any excess treatment capacity for Lathrop's wastewater flows outside of the existing agreement between Lathrop and Manteca. Staff indicated that the City of Manteca has a desire to maintain capacity at the WQCF for increased wastewater flows from Manteca's service area and has no plans to expand the WQCF until wastewater flows within its service area requires it to do so. Thus, there is a significant question regarding whether the City of Manteca would even allow this alternative.

This alternative would not achieve the project objective to maximize use of recycled water in the City because all of the City's wastewater would be conveyed to the Manteca WQCF, and it is uncertain whether the treated effluent would be conveyed back to the City as a source of recycled water.

### 5.3.2 Retain Lathrop CTF at Current Capacity and Expand WQCF to Treat Wastewater in Excess of Lathrop's Current Wastewater Management Capacity Alternative

The Retain Lathrop CTF at Current Capacity and Expand WQCF to Treat Wastewater in Excess of Lathrop's Current Wastewater Management Capacity Alternative would retain the CTF at its current capacity and expand the Manteca WQCF to treat wastewater in excess of Lathrop's current wastewater management capacity. With this alternative, Lathrop would not need its own surface water discharge. This alternative would retain the Lathrop CTF at its current capacity of 2.5 mgd and retain its recycled water reuse system. Wastewater in excess of Lathrop's CTF treatment capacity or planned recycled water reuse capacity would be conveyed to the Manteca WQCF for treatment and discharge to the San Joaquin River. In months when Lathrop is unable to fully manage CTF effluent through storage, land application, reuse or percolation (e.g., winter months), wastewater flows for Lathrop's service area would all be diverted to the Manteca WQCF for treatment and discharge to the San Joaquin River. In months when Lathrop's reuse irrigation demands exceed CTF effluent production because the CTF is limited to 2.5 mgd of capacity (e.g., summer months), Lathrop would need to meet irrigation demands with alternative water supplies. However, in the months when there is reuse irrigation demand, but those demands are less than CTF effluent production, a sophisticated raw wastewater diversion system would need to be implemented, such that raw wastewater is diverted away from the CTF for treatment at the Manteca WQCF during periods so that Lathrop's effluent management system capacity is not exceeded. Such a system is impractical for implementation, as it would require real-time monitoring of wastewater flows, crop irrigation demands, precipitation amounts, and pond storage, such that any raw wastewater flows in excess of demands and storage capacities is diverted to the WQCF for treatment (RBI 2019:31–32). Furthermore, as discussed under the previous alternative in Section 5.3.1, the City of Manteca has a desire to maintain capacity at the WQCF for increased wastewater flows from Manteca's service area and has no plans to expand the WQCF until wastewater flows within its service area requires it to do so. Thus, as with the previous alternative, it is questionable whether the City of Manteca would allow this alternative. Due to these issues, this alternative is considered to be an infeasible alternative and is not considered further for implementation. This alternative would not achieve the project objective to maximize use of recycled water in the City.

## 5.4 ALTERNATIVES SELECTED FOR DETAILED ANALYSIS

The following alternatives are evaluated in this Draft EIR.

- **Alternative 1: No Project Alternative** assumes no surface water discharge infrastructure would be constructed. All wastewater would continue to be recycled and reused for landscape irrigation or disposed of via land application. This would require use of lands for storage and disposal that are currently designated for urban development in the City of Lathrop's General Plan because acquisition of adequate storage and land application areas outside the City limits is infeasible. Thus, the City's ability to develop consistent with its General Plan would be constrained under this alternative.
- **Alternative 2: Outfall Configuration Alternative** assumes that a bottom diffuser outfall would be constructed instead of the proposed side bank outfall at the currently proposed outfall location for the project.
- **Alternative 3: Manteca WQCF Outfall Location Alternative** assumes that all CTF effluent could be discharged at the Manteca WQCF outfall at river mile 57. (Note: The outfall for the proposed project would be located at river mile 55.8.) This would include construction of a discharge pipeline and future expansion of the Manteca outfall structure. The discharge pipeline route has not been specifically identified. However, it would require crossing the Union Pacific Railroad rail line and SR 120.

Further details on these alternatives, and an evaluation of environmental effects relative to the proposed project, are provided below.

## 5.4.1 Alternative 1: No Project Alternative

Under Alternative 1, the No Project Alternative, no actions would be taken by the City to allow discharge of treated effluent to the San Joaquin River. The CTF would not be modified to incorporate dechlorination of treated effluent to allow for this discharge, the new effluent pipeline would not be installed, and the outfall location identified for the proposed project would remain undeveloped. All wastewater would continue to be treated, stored in ponds, and used for landscape irrigation or disposed of via land application on land currently designated for urban development in the City of Lathrop's General Plan and landscape irrigation because acquisition of adequate storage and land application areas outside the City limits is infeasible.

CTF flows at buildout, based on the current General Plan and the City's current wastewater and recycled water master plans (EKI 2019a, 2019b) are projected to be 5.2 mgd ADWF. Additionally, the City approved expansion of the CTF and completed project-level CEQA documentation for expansion up to 6.0 mgd ADWF and program-level CEQA documentation for expansion to a total capacity of up to 9.1 mgd ADWF in the adopted *City of Lathrop Consolidated Treatment Facility Project Initial Study/Mitigated Negative Declaration* (2013 CTF IS/MND) (City of Lathrop 2013).

As indicated above, the No Project Alternative assumes no surface water discharge infrastructure would be constructed. All wastewater would be recycled and continue to be disposed of via land application. Because agricultural land outside the City limits that could be used for storage and land application of recycled water would be too expensive and the landowners have expressed an unwillingness to sell this land to the City (RBI 2019:14), existing lands currently used for recycled water storage and disposal within the City, although designated under the General Plan for urban development, would not be developed with urban uses and would remain in use for recycled water storage and disposal. In addition, as some areas of the City grow, wastewater generation and the need for disposal would increase, committing other land designated for urban development within the City to treated effluent storage and disposal. This would preclude the ability of the City to fulfill its General Plan land use vision. Therefore, the No Project Alternative would not meet the key project objective to provide for planned City buildout and development based on the City's General Plan.

Because CEQA requires consideration of the No Project Alternative, it is evaluated herein. For purposes of comparison with the other action alternatives, conclusions for each technical area are characterized as "impacts" that are greater, similar, or less, to describe conditions that are worse than, similar to, or better than those of the proposed project.

### AIR QUALITY

With implementation of Alternative 1, there would be no modifications to the CTF beyond those that were previously analyzed in the 2013 CTF IS/MND, and no effluent pipeline or outfall construction for a surface water discharge to the San Joaquin River would occur. Development of new recycled water storage and/or land application areas would occur within the City and less overall urban development would be achieved. Development of new recycled water storage and/or land application areas would result in construction-related sources of air pollutants and new operational sources of air pollutants that could include pumps, generators, and other on-site mechanical equipment associated with transporting water to and from these facilities, which would not be required as part of the proposed project. It is unknown if use of Tier 4 equipment or other measures would be sufficient to reduce emissions of air quality pollutants to a less-than-significant level. Therefore, construction- and operations-related air pollutant emissions associated with Alternative 1 would likely be greater compared to the proposed project. (Greater)

### TERRESTRIAL BIOLOGICAL RESOURCES

With implementation of Alternative 1, no effluent pipeline or outfall construction for a surface water discharge to the San Joaquin River would occur, and all wastewater would be recycled and disposed of via land application. Impacts on riparian habitat would be avoided under this alternative. Under this alternative, existing lands used for recycled water storage would not be converted to urban uses and other agricultural land designated for urban development would be maintained in agricultural uses to support the greater need for land application of recycled water associated with future development. Development of additional storage ponds that would be needed to support recycled water use could result in injury to or loss of terrestrial biological species depending on where the storage ponds would be located. However, it is anticipated that use of exclusion fencing, no-disturbance buffers, or other standard avoidance and minimization measures would reduce these impacts to a less-than-significant level. Therefore, under Alternative 1, impacts on terrestrial biological resources would be similar to those of the proposed project. (Similar)

## AQUATIC BIOLOGICAL RESOURCES

The proposed project would result in discharge of treated effluent to the San Joaquin River, but the analysis in Section 3.4 concluded that there would be no significant impacts to aquatic biological resources associated with project operations. A potentially significant impact could occur during construction of the coffer dam and dewatering of the work area because this activity could entrain sensitive fish species in the coffer dammed area resulting in fish injury or mortality. However, with implementation of Mitigation Measure 3.4-2 during the dewatering process, this potential impact would be reduced to less than significant. With implementation of Alternative 1, no construction of the surface water discharge outfall at river mile 55.8 would occur, and no discharge of treated effluent into the San Joaquin River would occur. Rather, all wastewater would be recycled and disposed of via land application. Therefore, Alternative 1 would avoid direct fish injury or mortality that could result in impacts on fish populations. Thus, Alternative 1 would have no impact on aquatic biological resources. (Less)

## CULTURAL, TRIBAL CULTURAL, AND PALEONTOLOGICAL RESOURCES

Under Alternative 1, CTF modifications to allow discharge of effluent to the San Joaquin River would not occur, agricultural activities would continue within the City to provide for land application of CTF effluent, and new recycled water storage ponds and distribution lines would also need to be developed for the same purpose. The location of future recycled water storage facilities and distribution lines is not known, but could be located in areas sensitive for cultural, tribal cultural or paleontological resources. The proposed project would not have the potential to affect historical resources, as discussed under Impact 3.5-1, or paleontological resources, as discussed under Impact 3.5-5, but could result in discovery, damage to, or disturbance of previously undiscovered unique archaeological resources, newly discovered resources recognized as tribal cultural resources, and previously unrecorded human remains. These potentially significant impacts would be reduced to a less-than-significant level with implementation of Mitigation Measures 3.5-2, 3.5-3, and 3.5-4. It is anticipated that under Alternative 1, the same mitigation measures would be implemented to reduce potential impacts to archaeological and tribal cultural resources and human remains. Furthermore, because the geologic units underlying most of the undeveloped parts of Lathrop would be consider low sensitivity for paleontological resources for the same reasons the project site is considered low sensitivity (see discussion of Impact 3.5-5), implementation of Alternative 1 would not likely result in impacts to paleontological resources. It is likely that new storage ponds and distribution lines could be sited to avoid potential impacts to any historical resources as well. Therefore, implementation of Alternative 1 would be expected to have similar impacts related to cultural, tribal cultural, and paleontological resources as the proposed project. (Similar)

## ENERGY

With implementation of Alternative 1, there would be no modifications to the CTF beyond those that were previously analyzed in the 2013 CTF IS/MND, and no effluent pipeline or outfall construction for a surface water discharge to the San Joaquin River would occur. Development of new recycled water storage and/or land application areas would occur within the City and less overall urban development would be achieved. Similar to the proposed project, the one-time energy expenditure required to construct additional recycled water storage and distribution facilities would be nonrecoverable; there would likely be no atypical construction-related energy demand; and nonrenewable energy would not be consumed in a wasteful, inefficient, or unnecessary manner when compared to other construction activity in the region. Moreover, this one-time energy expenditure would support planned growth in the City, although not likely to the level identified in the current General Plan; would provide efficient and cost-effective wastewater services to the City; and would maximize the use of recycled water in the City. Therefore, construction energy consumption would not be wasteful, inefficient, or unnecessary. Therefore, energy impacts associated with implementation of Alternative 1 would be similar to those of the proposed project. (Similar)

## GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

With implementation of Alternative 1, there would be no modifications to the CTF beyond those that were previously analyzed in the 2013 CTF IS/MND, and no effluent pipeline or outfall construction for a surface water discharge to the San Joaquin River would occur. Development of new recycled water storage and/or land application areas would occur within the City and less overall urban development would be achieved. Development of new recycled water storage and/or land application areas would result in construction-related sources and new operational sources of greenhouse gas (GHG) emissions that could include pumps, generators, and other on-site mechanical equipment associated with transporting water to and from these facilities, which would not be required as part of the proposed project. Therefore, construction- and operations-related greenhouse gas emissions associated with Alternative 1 would likely be greater compared to the proposed project. (Greater)

## HAZARDS AND HAZARDOUS MATERIALS

With implementation of Alternative 1, there would be no changes to the existing use of hazardous materials at the CTF beyond those that were previously analyzed in the 2013 CTF IS/MND and no effluent pipeline or outfall construction for a surface water discharge to the San Joaquin River would occur. Development of new recycled water storage and/or land application areas would occur within the City Therefore, like the proposed project, Alternative 1 would have the potential to result in the disturbance of previously unknown subsurface contaminants. However, implementation of Mitigation Measure 3.8-1 would reduce this potential impact to a less-than-significant level. Under Alternative 1, contractors would also be required to implement traffic control plans. Therefore, implementation of Alternative 1 would have similar impacts related to hazards and hazardous materials compared to the proposed project. (Similar)

## HYDROLOGY AND WATER QUALITY

With implementation of Alternative 1, no construction of the surface water discharge outfall at river mile 55.8 would occur, and no discharge of treated effluent into the San Joaquin River would occur. Rather, all wastewater would be recycled and disposed of via land application. Alternative 1 would require development of new recycled water storage and distribution lines, but these facilities would be designed to avoid surface runoff and flooding, and would meet all applicable regulatory and design requirements. Because Alternative 1 would not result in a new discharge of treated effluent to the San Joaquin River, the potential for construction- and operations-related impacts on hydrology and water quality would be reduced with implementation of Alternative 1 compared to the proposed project. (Less)

## NOISE AND VIBRATION

With implementation of Alternative 1, there would be no modifications to the CTF beyond those that were previously analyzed in the 2013 CTF IS/MND, and construction of an effluent pipeline or outfall to discharge treated effluent to the San Joaquin River would occur. Development of new recycled water storage and/or land application areas would occur within the City and less overall urban development would be achieved. The development of new recycled water storage and/or land application areas would result in some temporary construction noise and the potential for some operational noise associated with generators or other mechanical equipment at those sites, if needed, which would not be required as part of the proposed project. Because these facilities could be constructed in close proximity to existing or future residential development or other sensitive receptors, implementation of Alternative 1 would potentially result in greater noise impacts compared to the proposed project. (Greater)

## 5.4.2 Alternative 2: Outfall Configuration Alternative

Alternative 2 would involve discharge of treated effluent to the San Joaquin River using a bottom diffuser outfall instead of the proposed side bank outfall at the currently proposed outfall location for the project. Alternative 2 would include the same proposed CTF modifications and proposed pipeline improvements as identified for the proposed project. However, CTF-treated effluent would be discharged to the San Joaquin River using a diffuser-type outfall installed on the bottom of the San Joaquin River at approximately the same river mile as the proposed project. Construction of the levee crossing would be similar to that described for the proposed project. The diffuser outfall would be installed along the bottom of the river and would include multiple ports from which effluent would be discharged. The construction methods for the diffuser outfall could vary between digging a trench in the wet and installing a prefabricated pipe or could involve directional drilling to install the pipe along the river bottom. Digging a trench would likely involve use of barges with excavators anchored in the river. A headwall and riprap on the riverbank would not be required to be installed for the bottom diffuser outfall.

Because Alternative 2 would allow for the discharge of treated effluent to the San Joaquin River similar to that which could occur with the proposed project, this alternative would allow for the disposal of treated effluent to be redirected from land disposal to surface water discharge. Operation of this alternative would also allow for treated effluent to be used as recycled water to support irrigation of landscaping areas in the City at certain times during the year. Thus, land currently used for land application of treated effluent that is designated for urban development would be available for such uses consistent with the City's General Plan. For these reasons, the project objectives to provide efficient and cost-effective wastewater services for the City and maximize use of recycled water in the City would also be met.

### AIR QUALITY

Alternative 2 would result in similar construction activities as the proposed project because this alternative proposes to implement the same pipeline improvements and CTF modifications as identified for the proposed project. However, implementation of this alternative could include the initial installation of the effluent pipe under the levee using horizontal directional drilling. This construction methodology requires a mud pit return system, mixing equipment, and drill machine, as well as other equipment. This alternative would also potentially require the use of barges to install the diffuser in the channel. Alternative 2 would include the same operational changes at the CTF as described for the proposed project which would not introduce new operational energy, transportation, or stationary source emissions of air pollution as compared to baseline conditions; thus, operation of this alternative would similarly not produce an operational air quality impact. Because the bottom diffuser outfall could include construction activities involving mixing equipment, a drilling machine, and the use of barges not required for construction of the proposed project, the consumption of gasoline and diesel fuels would potentially result in greater air pollutant emissions compared to the proposed project. Mitigation similar to Mitigation Measure 3.2-1 may be insufficient to reduce these air emissions below significance thresholds. Therefore, construction of Alternative 2 could result in greater air pollutant emissions compared to the proposed project. (Greater)

### TERRESTRIAL BIOLOGICAL RESOURCES

With implementation of Alternative 2, all construction elements would be the same as the proposed project except a bottom diffuser outfall would be constructed in the river instead of the proposed side bank outfall. The bottom diffuser outfall would be constructed at the same location as the proposed project side bank outfall. Implementation of this alternative could include the initial installation of the effluent pipe under the levee using horizontal directional drilling. This construction methodology uses bentonite mud as lubricant for the drill and requires a larger staging area due to equipment needs, mud pit return system, mixing equipment, and drill machine, as well as other equipment. This alternative could also require the use of barges to install the diffuser, which would involve use of long pilings (spud piles) to moor the barge. Because the construction area on the levee is assumed to be larger for Alternative 2 due to the construction methods needed compared to the proposed project, the magnitude of the impact on terrestrial biological resources could be slightly greater than those of the proposed project. However, similar to the proposed project, Alternative 2 would result in a less-than-significant impact on terrestrial biological resources after implementation of Mitigation Measures 3.3-1 through 3.3-7. (Similar)

## AQUATIC BIOLOGICAL RESOURCES

With implementation of Alternative 2, a multiport diffuser would be installed on the river bottom from which CTF effluent would be discharged to the San Joaquin River at the same location and with the same quality, timing, and volumes as that of the proposed project. Construction of a diffuser outfall would involve a greater area of disturbance within the San Joaquin River channel compared to that of the proposed project. However, unlike the proposed project, use of a coffer dam and dewatering of the in-river work area would not occur under Alternative 2 and implementation of Mitigation Measure 3.4-2 would not be required. Construction within the channel under Alternative 2 would likely involve the use of excavators staged from barges moored with spud piles in the river. The large zones of passage unaffected or minimally affected thermally by the discharge plume that would exist under the proposed project would be reduced in size for Alternative 2. This is because the diffuser would discharge effluent across more of the river cross-section, thereby reducing the size of zones of passage for fish somewhat compared to the proposed project. Consequently, the diffuser outfall could result in a somewhat greater impact on fish passage than the proposed project. (Greater)

## CULTURAL, TRIBAL CULTURAL, AND PALEONTOLOGICAL RESOURCES

Earth-moving activities within the project site have the potential to disturb archaeological resources, tribal cultural resources, or result in accidental discovery of human remains. Under the proposed project and Alternative 2, there would be similar levels of ground-disturbing activities (e.g., grading, excavation) within a similar project site that could result in discovery of archaeological resources, tribal cultural resources, or human remains; however, feasible mitigation measures would reduce these impacts to a less-than-significant level. As described for the proposed project under Impact 3.5-4 in Section 3.5, "Cultural, Tribal Cultural, and Paleontological Resources," no paleontological resources have been identified within the proposed project site, which is similar to the site for Alternative 2. The project site is underlain by geologically immature flood basin (Qb) and river (Qr) deposits, which are considered to have a low paleontological potential. Based on the geologic immaturity and considerable depth of these basin (Qb) and river (Qr) deposits and the extensive prior disturbances to the area, Alternative 2 would have no potential to affect paleontological resources. Because the area of impact would be the same under the proposed project and Alternative 2, impacts on cultural resources and paleontological resources under Alternative 2 would be similar to those under the proposed project. (Similar)

## ENERGY

Alternative 2 would include similar construction activities to the proposed project, although construction of the diffuser outfall would require some different types of equipment than would be used for construction of the side-bank outfall under the proposed project. Nevertheless, as with Alternative 1, the one-time energy expenditure required to construct Alternative 2 would be nonrecoverable; there would be no atypical construction-related energy demand; and nonrenewable energy would not be consumed in a wasteful, inefficient, or unnecessary manner when compared to other construction activity in the region. Additionally, the one-time energy expenditure would support all project objectives. Therefore, under Alternative 2, construction energy consumption would not be wasteful, inefficient, or unnecessary and energy impacts would be similar to those of the proposed project. (Similar)

## GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Alternative 2 would result in a similar construction schedule as that discussed for the proposed project because this alternative proposes to implement the same pipeline improvements and CTF modifications as identified for the proposed project. However, implementation of this alternative could include the initial installation of the effluent pipe under the levee using horizontal directional drilling. This construction methodology requires a mud pit return system, mixing equipment, and drill machine, and other equipment. This alternative would also potentially require the use of barges to install the diffuser in the channel. Alternative 2 would include the same operational changes at the CTF as described for the proposed project which would not introduce new operational energy, transportation, or stationary source GHG emissions as compared to baseline conditions; thus, operation of this alternative would similarly not produce an operational GHG impact. Because the bottom diffuser outfall could include construction activities involving mixing equipment, a drilling machine, and the use of barges not required for construction of the proposed project, the consumption of gasoline and diesel fuels could result potentially in greater GHG emissions compared to the proposed project, although on a global scale, the difference would likely not be noticeable. (Similar)

## HAZARDS AND HAZARDOUS MATERIALS

Alternative 2 would result in similar potential hazards and hazardous materials impacts as identified for the proposed project in Impact 3.8-1, because this alternative proposes to implement the same CTF modifications and pipeline improvements as identified for the proposed project. Additionally, the bottom diffuser outfall would not include any construction activities or characteristics that would result in different impacts than those described for the proposed project side-bank outfall. Alternative 2 would also be subject to the same avoidance measure identified in Mitigation Measure 3.8-1 to stop construction if potential subsurface contamination is discovered. The contractor would be required to develop and implement a plan to remediate the contamination before proceeding with construction to avoid and protect existing utility infrastructure and reduce potentially significant impacts related to exposure of construction workers, adjacent land uses, or the environment to previously unknown hazardous materials contamination during construction. Alternative 2 would include the same operational changes at the CTF as described for the proposed project; thus, operation of this alternative would not create a significant health hazard from the routine, transport, use, or disposal of hazardous materials or accidental release into the environment.

Furthermore, because the location of the bottom diffuser outfall would be similar to that of the side bank outfall, and all other construction would be the same as for under the proposed project, construction of Alternative 2 could result in a similar potential for temporarily limiting emergency access or evacuation along local roadways as described for the proposed project in Impact 3.8-2. Alternative 2 would also be subject to Mitigation Measure 3.8-2 to develop and implement a traffic control plan that would reduce potential impacts related to emergency access by maintaining access along project site roadways.

For the reasons described above related to construction and operation of Alternative 2, the hazard and hazardous material impacts of this alternative would be similar to those of the proposed project. (Similar)

## HYDROLOGY AND WATER QUALITY

With implementation of Alternative 2, a multiport diffuser would be installed on the river bottom from which CTF effluent would be discharged to the San Joaquin River at the same location and with the same quality, timing, and volumes as that of the proposed project. Effects on hydrology would be negligible for both the proposed project and Alternative 2. The minor level of water quality degradation that would occur for some constituents for the proposed project also would occur for Alternative 2. The diffuser outfall would result in a similar size of mixing zones for barium, electrical conductivity, or trihalomethanes compared to that for the proposed project. The amount of degradation that would occur for certain constituents upon effluent fully mixing with river flows would be identical for the proposed project and Alternative 2. Thus, Alternative 2 would result in impacts on hydrology and water quality similar to those of the proposed project. (Similar)

## NOISE AND VIBRATION

With implementation of Alternative 2, the effluent discharge pipeline and levee crossing would be constructed in the same locations as the proposed project and, thus, would result in similar construction noise and vibration levels at the same noise-sensitive receptors. Modifications to and operation of the CTF would be the same as the proposed project; therefore, generating the same noise levels as the proposed project. Alternative 2 could include the initial installation of the effluent pipe under the levee using horizontal directional drilling which would require a mud pit return system, mixing equipment, and drill machine. In addition, construction of the bottom diffuser outfall would likely use a barge and excavation equipment during construction in the river. In-river construction would occur farther away from noise sensitive receptors because a bottom diffuser outfall must be constructed under the river itself rather than on the riverbank, and directional drilling to install the pipe under the levee would occur in the same location as pipeline installation on the landside of the levee under the proposed project. The bottom diffuser outfall would not generate any operational or stationary noise at noise-sensitive receptors because all mechanical equipment would be located at the CTF. Overall, Alternative 2 would result in noise impacts similar to those of the proposed project. (Similar)

## 5.4.3 Alternative 3: Manteca WQCF Outfall Location Alternative

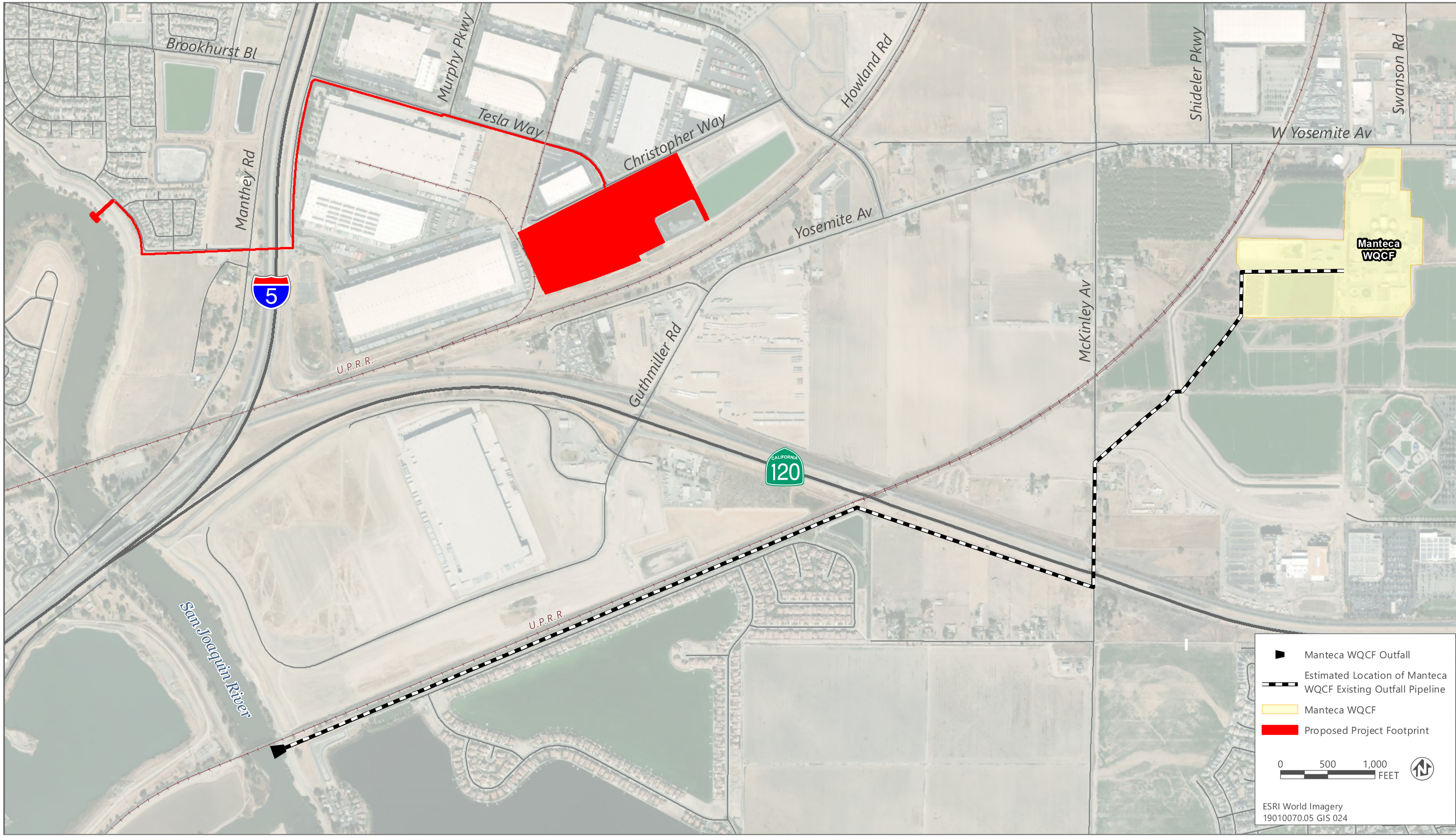
Alternative 3 would discharge treated effluent to the San Joaquin River using the existing Manteca WQCF side-bank outfall located at river mile 57. Alternative 3 would include the same modifications at the CTF as those for the proposed project to dechlorinate treated effluent. This alternative would require construction of a new discharge pipeline to convey treated effluent to the Manteca WQCF outfall. A specific route for the new pipeline has not been specifically identified, but a new pipeline would likely be reasonably similar in length to the pipeline require for the proposed project. It would need to cross SR 120 and a Union Pacific Railroad rail line to tie into the infrastructure at the levee where the Manteca outfall is located. Alternatively, the pipeline would cross SR 120 and the Union Pacific Railroad rail line and could tie into the Manteca WQCF pipeline that conveys flows to the outfall. Figure 5-1 shows the location of the existing Manteca WQCF outfall relative to the proposed project. If the effluent pipeline was tied into the Manteca WQCF pipeline, the Manteca WQCF pipeline would likely need to be expanded in the future to accommodate increasing flows from both Manteca and Lathrop as the cities grow. The Manteca WQCF outfall structure also would likely need to be expanded in the future; thus, in-river outfall construction similar to that for the proposed project would also occur under Alternative 3.

As with the proposed project, under Alternative 3, Lathrop capacity at the WQCF would continue to be limited to 1.45 mgd, and all other City wastewater would be treated first at the CTF and then discharged at the Manteca WQCF outfall.

Because Alternative 3 would allow for the discharge of treated effluent to the San Joaquin River similar to that which would occur with the proposed project, this alternative would allow for the disposal of treated effluent to be redirected from land disposal to surface water discharge when demand for recycled water is low, and otherwise directed to recycled water use for landscape irrigation in the City. Thus, land currently used for land application of treated effluent that is designated for urban development would be available for such uses consistent with the City's General Plan. For these reasons, the project objectives to provide efficient and cost-effective wastewater services for the City and maximize use of recycled water in the City would also be met. However, Lathrop staff have expressed concern over implementation of an alternative that would share an outfall with Manteca because it is unclear how potential violations of the National Pollutant Discharge Elimination System (NPDES) permit receiving water limitations would be determined, if one were to occur. It is also uncertain as to whether the City of Manteca would agree to implement this alternative.

### AIR QUALITY

Alternative 3 would similarly not introduce new operational energy, transportation, or stationary source emissions of air pollution as compared to baseline conditions. Because Alternative 3 would rely on the existing Manteca Outfall and potentially could tie into the existing Manteca WQCF pipeline which would reduce the length of effluent pipeline construction compared to the proposed project, Alternative 3 would entail less construction initially. However, expansion of the Manteca WQCF pipeline and outfall structure would eventually be needed, which would result in construction activities similar to those that would occur as part of the proposed project. Therefore, the amount of gasoline and diesel fuel consumed for project construction would be expected to be similar to that consumed for the proposed project, which would result in similar amounts of emissions of air pollution. Because operational and construction impacts would be similar for Alternative 3 and the proposed project, and mitigation for air quality impacts would be similar, implementation of Alternative 3 would result in air quality impacts similar to those of the proposed project. (Similar)




Source: Adapted by Ascent Environmental in 2020

Figure 5-1 Location of the Existing Manteca WQCF Outfall

## TERRESTRIAL BIOLOGICAL RESOURCES

With implementation of Alternative 3, the route of the effluent pipeline from the CTF to the outfall location would be different than the proposed project. The nearest potential connection point between the CTF and the Manteca WQCF 36-inch effluent pipeline is at the south side of the intersection of SR 120 and the Union Pacific Railroad, just northeast of the Oakwood Shores Community. Although the specific pipeline route for this alternative has not been determined, this analysis assumes that the route would follow existing roadways, similar to the proposed project. Alternative 3 could ultimately require expansion of the existing Manteca WQCF outfall to the San Joaquin River as well as the Manteca WQCF pipeline which would involve construction similar to the proposed project; thus, impacts on western pond turtle, giant garter snake, riparian brush rabbit, sensitive natural communities (e.g., valley oak woodland and forest), and wildlife corridors would likely be similar to that of the proposed project. Unlike the proposed project, the outfall under Alternative 3 is existing and therefore construction would occur in a more disturbed environment potentially impacting different wildlife compared to the proposed project, such as burrowing owl (*Athene cunicularia*). Like the proposed project, Alternative 3 would also be required to implement San Joaquin County Multi-Species Habitat Conservation and Open Space Plan mitigation and minimization measures in order to reduce those potential impacts to a less-than-significant level. Impacts on terrestrial wildlife would be similar to those of the proposed project, but for the reasons described here, this alternative may result in different impacts on land cover types during construction activities because it is assumed that only developed, ruderal, and farmland land cover types would be affected and that outfall construction would occur at an existing developed outfall site. (Similar)

## AQUATIC BIOLOGICAL RESOURCES

With implementation of Alternative 3, no CTF outfall would be constructed in the San Joaquin River at river mile 55.8. Rather, CTF treated effluent would be piped to and discharged from the Manteca WQCF outfall into the San Joaquin River at river mile 57.0. The quality, volume, and timing of CTF effluent discharges would be the same as under the proposed project, but both cities' effluent would be discharged at a single location rather than at two separate locations approximately 1.2 miles apart. Manteca's outfall structure would need to be expanded at some point in the future and thus in-river outfall construction would occur for Alternative 3. Consequently, Alternative 3 could result in a outfall construction-related direct fish injury or mortality and resulting impacts on fish populations, similar to what would occur with the project (which is mitigable). Due to substantially larger volumes of effluent being discharged at a single location, the thermal plume that would exist within the San Joaquin River channel at the shared outfall site would have multidegree Fahrenheit thermal gradients over a substantially larger area of the river compared to that which would occur for the proposed project, where the two cities discharge at separate locations. Such larger thermal plumes for Alternative 3 would be an adverse thermal condition for fish passage and could result in other possible adverse thermal effects compared to the smaller thermal plumes that would occur at each city's separate outfall location under the proposed project. For the proposed project, each city's thermal discharge would undergo substantial thermal attenuation prior to the affected river water combining as flows move down-current. Alternative 3 would result in increased risks of thermal effects on thermally sensitive special-status fishes that would pass through the thermal plume in the river, which would be larger under Alternative 3. (Greater)

## CULTURAL, TRIBAL CULTURAL, AND PALEONTOLOGICAL RESOURCES

Earth-moving activities associated with construction of the discharge pipeline for development of Alternative 3 would have the potential to disturb archaeological resources, tribal cultural resources, or result in accidental discovery of human remains. Under the project and Alternative 3, there would be similar levels of ground-disturbing activities (e.g., grading, excavation) that could result in discovery of archaeological resources, tribal cultural resources, or human remains; however, feasible mitigation measures would reduce these impacts to a less-than-significant level. Alternative 3 would be located in areas similar to those in the project site in close proximity to the San Joaquin River, so it is possible that Alternative 3 and the proposed project would have a similarly low potential for disturbance of paleontological resources. However, a site-specific analysis would be required to determine whether the Alternative 3 site contains geologically sensitive areas, which could result in disturbance to or impacts on paleontological resources. (Similar)

## ENERGY

Alternative 3 would involve similar construction activities to the proposed project. The one-time energy expenditure required to construct Alternative 3 would be nonrecoverable; there would be no atypical construction-related energy demand; and nonrenewable energy would not be consumed in a wasteful, inefficient, or unnecessary manner when compared to other construction activity in the region. Additionally, the one-time energy expenditure would support all project objectives. Therefore, under Alternative 3, construction energy consumption would not be wasteful, inefficient, or unnecessary and energy impacts would be similar to those of the proposed project. (Similar)

## GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Similar to the proposed project, Alternative 3 would not introduce new operational energy, transportation, solid waste, or stationary source emissions of GHGs as compared to baseline conditions. Because Alternative 3 could ultimately require expansion of the existing Manteca WQCF pipeline and outfall to accommodate effluent from both cities, Alternative 3 would result in similar construction as that for the proposed project. Therefore, the amount of gasoline and diesel fuel consumed during construction for Alternative 3 would be expected to be similar to that consumed for the proposed project, which would result in similar emissions of GHGs. Thus, operational and construction impacts related to GHG emissions for Alternative 3 would be similar to those for the proposed project. (Similar)

## HAZARDS AND HAZARDOUS MATERIALS

Alternative 3 would result in similar potential hazards and hazardous materials impacts as identified for the proposed project in Impact 3.8-1 because this alternative would include similar pipeline improvements as identified for the proposed project and could also ultimately require expansion of the existing Manteca WQCF outfall structure involving similar construction to the proposed project. Thus, this alternative would not include any construction activities or characteristics that would result in different impacts than those described for the proposed project. Alternative 3 would also be subject to similar avoidance measures like those identified in Mitigation Measure 3.8-1 for the proposed project to stop construction if potential subsurface contamination is discovered, and the contractor would be required to develop and implement a plan to remediate any contamination before proceeding with construction to reduce the potential for exposure of construction workers, adjacent land uses, or the environment to previously unknown hazardous materials contamination during construction. Alternative 3 would include the same operational changes at the CTF as described for the proposed project; thus, operation of this alternative would not create a significant health hazard from the routine, transport, use, or disposal of hazardous materials or accidental release into the environment.

This alternative would construct a new treated effluent pipeline to connect with the Manteca WQCF outfall. Thus, the potential to temporarily limit emergency access or evacuation along project roadways during construction of Alternative 3 would be similar to that described for the proposed project in Impact 3.8-2. Alternative 3 would also be subject to mitigation similar to Mitigation Measure 3.8-2, identified for the proposed project to develop and implement a traffic control plan that would reduce potential impacts related to emergency access by maintaining access along project site roadways. (Similar)

## HYDROLOGY AND WATER QUALITY

With implementation of Alternative 3, no CTF outfall would be constructed in the San Joaquin River at river mile 55.8. Rather, CTF treated effluent would be piped to and discharged from the City of Manteca's WQCF outfall into the San Joaquin River at river mile 57.0. The quality, volume, and timing of CTF effluent discharges would be the same, but both cities' effluent would be discharged at a single location rather than at two separate locations approximately 1.2

miles apart. Effects on hydrology would be negligible for both the proposed project and Alternative 3. The minor level of water quality degradation that would occur for some constituents for the proposed project upon CTF effluent fully mixing with river flows also would occur for Alternative 3. However, because a greater volume of effluent would be discharged from a single outfall, the amount of water quality degradation that could occur within the areas of initial mixing (i.e., prior to effluent completely mixing with river flows) would be greater for Alternative 3 than for the proposed project. The size of mixing zones for barium, electrical conductivity, or trihalomethanes would not change substantially compared to that for the proposed project. However, compared to the proposed project, Alternative 3 would result in greater water quality degradation near the outfall for some constituents, including temperature, due to the substantially greater volume of effluent discharged into the river at a single location. (Greater)

### NOISE AND VIBRATION

Under Alternative 3, the proposed outfall would be located farther upstream at the existing Manteca WQCF outfall and the effluent discharge pipeline route would be altered accordingly, though the route has not been specifically identified at this time. Noise generated by construction activities and facility operation would be similar to the proposed project because the same types of facilities would be constructed. However, the Manteca WQCF outfall is located farther away from noise-sensitive receptors than the outfall location for the proposed project, and it is likely that the effluent discharge pipeline route would not be constructed next to noise-sensitive receptors because there are no residential land uses in the area between the CTF and the Manteca WQCF outfall. Therefore, the noise and vibration impacts under Alternative 3 would likely be reduced compared to the noise and vibration impacts under the proposed project. (Less)

## 5.5 COMPARISON OF ALTERNATIVES

Table 5-1 summarizes the environmental analyses provided above for the project alternatives.

**Table 5-1 Summary of Environmental Effects of the Alternatives Relative to the Proposed Project**

| Environmental Topic | Proposed Project | Alternative 1: No Project Alternative | Alternative 2: Outfall Configuration Alternative | Alternative 3: Manteca WQCF Alternative |
|---|---|---|---|---|
| Air Quality | LTSM | Greater | Greater | Similar |
| Terrestrial Biological Resources | LTSM | Similar | Similar | Similar |
| Aquatic Biological Resources | LTSM | Less | Greater | Greater |
| Cultural, Tribal Cultural, and Paleontological Resources | LTSM | Similar | Similar | Similar |
| Energy | LTS | Similar | Similar | Similar |
| Greenhouse Gas Emissions and Climate Change | LTS | Greater | Similar | Similar |
| Hazards and Hazardous Materials | LTSM | Similar | Similar | Similar |
| Hydrology and Water Quality | LTS | Less | Similar | Greater |
| Noise and Vibration | LTS | Greater | Similar | Less |

Notes: LTS = less than significant; LTSM = less than significant with mitigation; WQCF = Water Quality Control Facility.

Source: Compiled by Ascent Environmental in 2020

# 5.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CCR Section 15126.6(e)(2) suggests that an EIR should identify the "environmentally superior" alternative. "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." As shown above in Table 5-1 and described in Sections 5.4.1, the No Project Alternative, or Alternative 1, would result in less impacts related to aquatic biological resources and hydrology and water quality and similar impacts related to terrestrial biological resources, cultural, tribal cultural, and paleontological resources, energy, and hazards and hazardous materials compared to the proposed project. However, impacts related to air quality, greenhouse gas emissions and climate change, and noise and vibration would be greater under the No Project Alternative than under the proposed project.

As described in Section 5.4.2, Alternative 2 would not avoid any potentially significant impacts of the proposed project; would result in similar impacts related to terrestrial biological resources, cultural, tribal cultural, and paleontological resources, energy, greenhouse gas emissions and climate change, hazards and hazardous materials, hydrology and water quality, and noise and vibration; but impacts related to air quality and aquatic biological resources would be greater than under the proposed project.

As described in Section 5.4.3, Alternative 3 would result in less potential construction noise and vibration effects and similar impacts related to air quality, terrestrial biological resources, cultural, tribal cultural, and paleontological resources, energy, greenhouse gas emissions and climate change, and hazards and hazardous materials compared to the proposed project. However, this alternative would result in greater impacts related to aquatic biological resources and water quality compared to the proposed project.

Because Alternative 1 would not allow growth in accordance with the Lathrop General Plan, and therefore, would not meet all of the objectives of the proposed project, and would introduce additional potentially significant impacts compared to the proposed project, the No Project Alternative would not be the environmentally superior alternative. Alternative 2 would meet the project objectives similar to the proposed project. However, the proposed project would avoid additional potentially significant impacts that could be caused by Alternative 2. Likewise, Alternative 3 would meet all of the project objectives; however, while this alternative would reduce impacts associated with noise and vibration relative to the proposed project, it would introduce additional potentially significant impacts. Additionally, implementation of Alternative 3 would require close coordination with the City of Manteca that may raise operational challenges, including uncertainty about how potential violations of the NPDES permit receiving water limitations would be apportioned and resolved between the two jurisdictions. Thus, the proposed project would be the environmentally superior action alternative.

# 6 OTHER CEQA SECTIONS

## 6.1 GROWTH INDUCEMENT

CEQA Section 21100(b)(5) specifies that the growth-inducing impacts of a project must be addressed in an EIR. Section 15126.2(e) of the State CEQA Guidelines provides the following guidance for assessing the growth-inducing impacts of a project:

> Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also, discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can induce growth directly, indirectly, or both. Direct growth inducement would result if a project involved construction of new housing. Indirect growth inducement would result, for instance, if implementing a project resulted in:

- substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises);
- substantial short-term employment opportunities (e.g., construction employment) that indirectly stimulates the need for additional housing and services to support the new temporary employment demand; or
- removal of an obstacle to additional growth and development, such as removing a constraint on a required public utility or service (e.g., construction of a major sewer line with excess capacity through an undeveloped area).

The State CEQA Guidelines do not distinguish between planned and unplanned growth for purposes of considering whether a project would foster additional growth. Therefore, for purposes of this EIR, to reach the conclusion that a project is growth inducing as defined by CEQA, the EIR must find that it would foster (i.e., promote, encourage, allow) additional growth in economic activity, population, or housing, regardless of whether the growth is already approved by and consistent with local plans. The conclusion does not determine that induced growth is beneficial or detrimental, consistent with Section 15126.2(e) of the State CEQA Guidelines.

If the analysis conducted for the EIR results in a determination that a project is growth inducing, the next question is whether that growth may cause adverse effects on the environment. Environmental effects resulting from induced growth (i.e., growth-induced effects) fit the CEQA definition of "indirect" effects in Section 15358(a)(2) of the State CEQA Guidelines. These indirect or secondary effects of growth may result in significant environmental impacts. CEQA does not require that the EIR speculate unduly about the precise location and site-specific characteristics of significant, indirect effects caused by induced growth, but a good-faith effort is required to disclose what is feasible to assess. Potential secondary effects of growth could include consequences—such as conversion of open space to developed uses, increased demand on community and public services and infrastructure, increased traffic and noise, degradation of air and water quality, or degradation or loss of plant and wildlife habitat—that are the result of growth fostered by the project.

The decision to allow those projects that result from induced growth is the subject of separate discretionary processes by the lead agency(ies) responsible for considering such projects. Because the decision to allow growth is subject to separate discretionary decision making, and such decision making is itself subject to CEQA, the analysis of growth-inducing effects is not intended to determine site-specific environmental impacts and specific mitigation for the potentially induced growth. Rather, the discussion is intended to disclose the potential for environmental effects to occur more generally, so that decision makers are aware that additional environmental effects are a possibility if growth-inducing projects are approved. The consideration of whether impacts would occur, their extent, and the ability to mitigate them is appropriately left to the agency responsible for approving such projects when complete applications for development are submitted.

## 6.1.1 Growth-Inducing Impacts of the Project

As described in Chapter 2, "Project Description," the proposed project would involve construction of a new effluent pipeline and outfall along the San Joaquin River and associated modifications at the Consolidated Treatment Facility (CTF). The project would allow for development of urban uses on existing agricultural land application areas and on some sites used for recycled water storage ponds in accordance with the approved General Plan land use designations. It would also maximize use of recycled water by allowing discharge of treated, dechlorinated effluent to the San Joaquin River at times of the year when demand for recycled water is low.

Construction of the proposed project would occur over approximately 1.5 years between spring 2021 and fall 2022. Separate contracts to construct the effluent pipeline, the CTF modifications, and the levee crossing and outfall structure would be implemented, and all three of these major components would proceed concurrently to the extent feasible. The average daily work force required to complete the CTF modifications is estimated to be 25 construction workers. The average daily work force to construct the effluent pipeline from the CTF to the landside toe of the levee is estimated to be 24 construction workers, and the average daily work force required to implement the effluent pipeline levee crossing and outfall structure is estimated to be 16 construction workers.

Operation of the proposed project would not require any changes to staffing at the CTF or to power, telecommunications, gas, water supply, recycled water distribution, or sewer infrastructure.

The proposed project would not include the construction of new housing. Although the proposed project would generate temporary demand for construction employees, it is anticipated that because the number of construction employees would be low and the project would be completed in less than 2 years, this temporary demand for construction employees would be met by existing residents in Lathrop or nearby areas (e.g., Manteca, Tracy, Stockton). Because the project would not involve constructing new housing, would not provide short-term employment opportunities that would indirectly stimulate the need for additional housing and services, and would not provide substantial new permanent employment opportunities, it would not be directly growth inducing.

However, the proposed project would remove an impediment to growth by providing an alternative effluent disposal mechanism that would allow for the planned expansion of the CTF treatment capacity and the removal of existing agricultural land application areas (LAAs) and recycled water storage ponds that have tied up lands designated for urban uses in accordance with the *Comprehensive General Plan for the City of Lathrop, California* (City of Lathrop 2004a) and this would be a growth-inducing effect.

The proposed project would not increase the treatment capacity at the CTF and would not involve the extension of wastewater collection service such that new areas would be served. However, as discussed in Section 1.3, "Tiering from the City of Lathrop Consolidated Treatment Facility Initial Study/Mitigated Negative Declaration and Other EIRs," the City has previously approved expansion of the CTF capacity up to 6.0 million gallons per day (mgd) average dry weather flow (ADWF) to accommodate planned growth (City of Lathrop 2013). The CTF has an existing design treatment capacity of 2.5 mgd ADWF, but the CTF's maximum discharge capacity is currently limited by the permitted disposal capacity of 1.69 mgd ADWF (Central Valley RWQCB 2019), which is limited to the amount of treated effluent that can be stored in existing storage ponds and pumped to the distribution system for irrigation of agricultural LAAs and public landscape areas and disposal in the percolation basin (PB-1). As discussed in Chapter 1, "Introduction," based on the current General Plan and the City's current wastewater and recycled water master plans (EKI 2019a, 2019b), CTF flows at buildout are projected to be 5.2 mgd ADWF. Additionally, if potential cumulative development proposed in the City is approved, the City at buildout could generate approximately 6 mgd ADWF (EKI 2020). As discussed in Section 1.3, "Tiering from the City of Lathrop Consolidated Treatment Facility Initial Study/Mitigated Negative Declaration and Other EIRs," the 2013 CTF Initial Study/Mitigated Negative Declaration (SCH No. 2013042011, adopted in June 2013) (City of Lathrop 2013) provides project-level CEQA authorization for expansion of the CTF treatment capacity from 3.0 mgd to 6.0 mgd.

The agricultural LAAs (except A35, A35b, and A35c) and all the storage ponds (except S5 and S16) that serve as effluent storage are designated by the Lathrop General Plan for commercial, residential, or urban development (Figure 2-3 in Chapter 2, "Project Description"). These agricultural LAAs and storage ponds are located within the City development areas identified as Central Lathrop Specific Plan, Mossdale Landing, River Islands, and Historic Lathrop Infill and Other Developments, which are shown in Figure 2-1 in Chapter 2, "Project Description." Retaining this land for effluent storage and disposal would prevent development of the properties in accordance with the General Plan land use designations. In order for future development in the City to occur as identified in the Lathrop General Plan, the proposed project is needed to redirect the use or disposal of treated effluent generated at the CTF using another disposal method, such as discharge to the San Joaquin River. Section 2.1, "Project Background and Need," describes in detail the estimated future wastewater treatment demand associated with buildout of the City. Although the proposed project itself does not expand wastewater treatment capacity, it would remove a limitation to growth associated with disposal of treated effluent generated at the CTF.

The project would improve the ability of the CTF to serve the growth planned in the *Comprehensive General Plan for the City of Lathrop, California* (City of Lathrop 2004a) and planned to occur within individual specific plan areas, including within the Central Lathrop Specific Plan, Mossdale Landing, River Islands, and Historic Lathrop Infill and Other Developments. The General Plan and each of these specific plans envisioned buildout of urban development in the City, which would include conversion of the lands containing the agricultural LAAs and storage ponds identified above to urban uses. Thus, the project would induce growth by removing an impediment to City growth in accordance with the General Plan and would result in secondary impacts related to that level of development, which has been addressed in the environmental analysis completed for the General Plan. The environmental documents prepared for the various specific plans in the City also analyzed the environmental effects of buildout of urban development (City of Lathrop 1995, 1997, 2003a, 2003b, 2004b, 2004c, 2004d, 2005, 2006, 2014, 2016). The following indirect environmental effects of the proposed project are associated with the conversion of these lands to urban uses.

## AESTHETICS

The growth that could potentially be served by the future development of land currently containing agricultural LAAs would result in urban encroachment into open space lands in the project area that contain agricultural lands or storage ponds. As in other parts of the Central Valley of California, views in rural areas are dominated by open spaces and cultivated agricultural fields. As urban encroachment continues in the region, preserving open space values may become more important. New urban development could increase local sources of glare when light reflects from various surfaces during daytime and nighttime hours.

## AGRICULTURE RESOURCES

The growth that could potentially be served by the future development of land currently containing agricultural LAAs would result in urban development replacing existing farmland that is designated as Prime Farmland or Farmland of Local Importance (California Department of Conservation 2020). This growth could also result in cancellation of Williamson Act contracts. The secondary effect of conversion of Prime Farmland to urban uses or cancellation of Williamson Act contracts would be a significant impact from such development projects.

## AIR QUALITY

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would result in development of residential, commercial, and other types of land uses in the City. This development could result in short- and long-term air quality impacts associated with construction-generated and operational emissions of criteria air pollutants and precursors, and toxic air emissions associated with this development. The secondary effect of increased short- and long-term air emissions associated with construction activities, vehicle trip generation, and area- and stationary-source emissions from such development could result in significant air quality impacts.

## BIOLOGICAL RESOURCES

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses could result in loss and fragmentation of habitat that supports native plant and wildlife species. These habitats include common habitat types, such as agricultural fields and ruderal habitat, as well as sensitive habitat types that could include riparian vegetation communities and jurisdictional waters. This development could also result in significant impacts on special-status plants and wildlife supported by these habitats. Future urban development would be required to comply with all applicable requirements of the *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan* related to the conversion of open space to developed uses.

## CULTURAL, TRIBAL CULTURAL, AND PALEONTOLOGICAL RESOURCES

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would result in ground-disturbing activities that could result in the discovery or damage of previously undiscovered archaeological resources as defined in State CEQA Guidelines Section 15064.5 or tribal cultural resources. It is also possible that unrecorded human remains could be discovered during ground-disturbing activities. In addition, it is possible that future development would be located in geologically sensitive areas, which could result in disturbance to or impacts on paleontological resources.

## ENERGY

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would result in the consumption of construction-related gasoline and diesel fuel and operational energy consumption from electricity, natural gas, gasoline, or diesel fuel consumption.

## GEOLOGY AND SOILS

Construction activities associated with conversion of existing agricultural LAAs and storage ponds to urban uses has the potential to disturb soils and result in erosion. However, with implementation of erosion controls/best management practices identified in storm water pollution prevention plans, a substantial amount of soil erosion would not be expected to occur. The proposed project would be designed and constructed to meet California Building Code requirements to avoid potentially significant impacts related to seismic hazards and soil stability. Additionally, the agricultural LAAs and storage ponds are located in relatively flat areas in the City of Lathrop within the Central Valley; therefore, there would be no impact related to landslides.

## GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would result in construction-related activities that would generate greenhouse gas (GHG) emissions from the use of heavy-duty off-road equipment, materials transport, and worker commute trips. This development could also result in long-term impacts associated with operational GHG emissions, including secondary effects of increased short- and long-term GHG emissions associated with vehicle trip generation and area- and stationary-source emissions from urban development of the agricultural LAAs and storage ponds.

## HAZARDS AND HAZARDOUS MATERIALS

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would result in construction and operational activities that could create a significant health hazard from the routine transport, use, or disposal of hazardous materials or from accidental releases of hazardous materials. Construction activities could potentially result in small fuel or oil spills during equipment refueling or routine maintenance, as well as exposure to previously unknown subsurface contaminants during trenching. Future development would be required to comply with General Plan policies and statewide regulations to minimize the potential to create health hazards and reduce the potential for accidental release or exposure to hazardous materials or waste. However, construction activities could encounter undocumented hazardous wastes during earthmoving or excavation activities, which could result in a hazard to construction workers, adjacent land uses, and the environment.

## HYDROLOGY AND WATER QUALITY

The growth that could occur as a result of conversion of existing agricultural LAAs and storage ponds to urban uses would result in construction of new paved areas and other impervious surfaces on undeveloped land that currently allows for groundwater infiltration during rain events. It is anticipated that future planning and stormwater infrastructure would be constructed in accordance with existing plans and regulations. Thus, it is anticipated that new infrastructure would be constructed, and existing facilities would be improved, to provide for the collection, detention storage, and conveyance of stormwater to receiving waters. Increased stormwater runoff from developed areas (e.g., oil products from roadways) could also result in significant impacts on the water quality of receiving waters. The secondary effect of increased stormwater runoff generated by new development could result in significant impacts on the hydrology of the local drainage systems and on the water quality of receiving waters in the Lathrop area.

## LAND USE AND PLANNING

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would not physically divide an established community, because these areas are currently undeveloped or are the location of a storage pond. As described above, development of these areas would be consistent with the approved General Plan land use designations. Additionally, because this future development would be consistent with the General Plan land use designations, it would be consistent with Delta Plan Policy DP P1 (Locate New Urban Development Wisely), which requires that new residential, commercial, and industrial development be limited to "[a]reas that city or county general plans as of May 16, 2013, designate for residential, commercial, and industrial development in cities or their spheres of influence" (Delta Stewardship Council 2013). The proposed project would also not include any expansions to wastewater treatment and disposal services that would serve areas outside of the City boundaries resulting in or supporting additional development. Individual future development projects within areas covered by the Delta Plan would also be required to demonstrate consistency with the Delta Plan.

## NOISE AND VIBRATION

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would result in development of residential, commercial, and other types of noise-sensitive and noise-generating land uses in the City. Short- and long-term construction-generated and operational noise and vibration sources could generate noise at levels that exceed applicable standards, resulting in annoyance and/or sleep disruption of existing and/or future sensitive receptors.

## PUBLIC SERVICES AND RECREATION

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would increase the need for public services. Construction of new fire, police, school, and park and recreation facilities and other public services could be required, which could result in significant construction-related environmental effects and further potential loss of open space and agricultural land. Increased population growth could also result in overuse of existing public service facilities, including community parks and recreation facilities. Increased population growth could affect emergency response times of the City's fire and police services.

## TRANSPORTATION

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would result in development of uses that generate new vehicle trips resulting in a permanent increase in vehicle miles traveled. Additionally, this growth could generate demand for pedestrian or bicycle facilities and transit services.

## UTILITIES

The growth that could occur as a result of converting existing agricultural LAAs and storage ponds to urban uses would increase the demand for water supply, wastewater services, electrical and natural gas service and infrastructure, and solid waste disposal. In 2019, the City adopted the Lathrop Integrated Water Resources Master Plan (IWRMP), which includes plans for providing future water, wastewater, and recycled water system infrastructure necessary to meet projected growth of the City's service area (EKI 2019a, 2019b, 2019c). The environmental impacts of improvements to the water, wastewater, and recycled water system infrastructure were assessed in the EIR prepared for the Lathrop IWRMP (City of Lathrop 2019). New development would result in an overall need to construct electrical and natural gas facilities and distribution infrastructure. Development of the agricultural LAAs and storage ponds to urban uses would increase the need for solid waste and recycling and collection services and disposal of solid waste in landfills.

## WILDFIRE

Because the City does not contain a State Responsibility Area or lands classified as a Very High Fire Hazard Severity Zone (CAL FIRE 2020), there would be no impact related to wildfire from the growth that could occur as a result of conversion of agricultural LAAs and storage ponds to urban uses allowed by implementation of the proposed project.

# 6.2 SIGNIFICANT AND UNAVOIDABLE ADVERSE IMPACTS

State CEQA Guidelines Section 15126.2(c) requires EIRs to include a discussion of the significant environmental effects that cannot be avoided if the proposed project is implemented. As documented throughout Chapter 3 (project-level impacts) and Chapter 4, "Cumulative Impacts," of this Draft EIR, after implementation of the recommended mitigation measures, the significant and potentially significant impacts associated with the proposed Lathrop CTF Surface Water Discharge Project would be reduced to a less-than-significant level. The analysis concludes that the proposed project would not result in significant and unavoidable impacts. As discussed for Impact 3.9-13 in Section 3.9, "Hydrology and Water Quality," there is ongoing research regarding endocrine-disrupting compounds (EDCs). Because the research is inconclusive, it was not identified as a significant effect even though there is more to learn about the effects of EDCs on people and the environment.

# 6.3 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

The State CEQA Guidelines require a discussion of any significant irreversible environmental changes that would be caused by the project. Specifically, State CEQA Guidelines Section 15126.2(d) states:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Implementing the project would result in the irreversible and irretrievable commitment of energy and material resources during construction and operation, including:

- construction materials, including such resources as soil, rock, concrete, steel, and polyvinyl chloride;
- water supply for project construction (for controlling dust and maintaining soil compaction);
- energy expended in the form of electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles that would be needed for project construction, operation, and maintenance: and
- a negligible increase in operational energy demand in the form of electricity, related to the introduction of a one-quarter-horsepower pump that would be used periodically during operation of the proposed project.

The use of these nonrenewable resources is expected to account for a minimal portion of the region's resources and would not affect the availability of these resources for other needs within the region. Construction activities would not result in inefficient use of energy, as described in Section 3.6, "Energy." Construction contractors selected would use best available engineering techniques, construction and design practices, and equipment operating procedures. As discussed for Impacts 3.6-1 and 3.6-2, long-term project operation would not substantially increase the long-term consumption of energy and natural resources over existing conditions. Moreover, the project would not result in any additional CTF staff or result in additional vehicular trips related to CTF maintenance or operations.

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